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[57]申請專利範圍:

- 1.一種衛生產品,其為在整個包裝於包裝膜中之本體的兩側上設有翼部的衛生棉,其中:
在包裝膜的內側塗布矽酮;與
將易於從矽酮塗層脫離的防滑黏膠的塗層形成在包裝膜的矽酮塗層側與衛生棉的反面之間。
- 2.如申請專利範圍第1項所述之衛生產品,其中:
將衛生棉之本體的兩縱長方向末端部分折向衛生棉的正面側;
將衛生棉的兩翼部折向衛生棉的正面側;與
將防滑黏膠塗布到衛生棉本體之縱長方向末端部分與中間部分的反面,與翼部的反面。
- 3.一種衛生產品製造設備,包含:
製造裝置,用於製造設有翼部的衛生棉;與
包裝裝置,用於將易於從矽酮塗層脫離

的防滑黏膠塗布到衛生棉的反面與將衛生棉包裝在內側塗有矽酮的包裝膜中,以生產衛生產品。

- 4.如申請專利範圍第3項所述之衛生產品製造設備,其製造裝置,其中從其滾筒所輸送之連續的表層片、從其滾筒所輸送之連續的吸收體片與從其滾筒所輸送之連續的內襯片分別行進,包含:
吸收體切割部,其從行進中的吸收體片在行進方向上間隔將吸收體逐一切下;
內襯片黏膠塗布部,其連續地在行進方向上將黏膠塗到行進中的內襯片上;
表層片黏膠塗布部,其連續地在行進方向上將黏膠塗到行進中的表層片上;
重合部,其將吸收體連續地置於行進中的表層片與行進中的內襯片之間與將其重合以製造衛生棉片;
熱封部,其將預定成為包含該吸收體的衛生棉之部分的輪廓線稍內側部分予以熱密封;與
- 5.
- 10.
- 15.
- 20.

衛生棉切割部，其從內側夾持了吸收體的衛生棉片逐一間隔切下一片片的衛生棉。

- 5.如申請專利範圍第4項所述之衛生產品製造設備，其中：
 - 吸收體切割部包含成對的砧輥與沖切輥；
 - 沖切輥在其圓周上具有切割刀，以切下吸收體；與
 - 吸收體片行進到成對的砧輥與沖切輥之間，以將吸收體逐一切下。
- 6.如申請專利範圍第4或5項所述之衛生產品製造設備，其中：
 - 熱封部包含成對的砧輥與熱封輥；
 - 熱封輥在其圓周上具有非加熱部，其各稍小於衛生棉；與
 - 衛生棉片行進到成對的砧輥與熱封輥之間。
- 7.如申請專利範圍第4或5項所述之衛生產品製造設備，其中：
 - 衛生棉切割部包含成對的砧輥與沖切輥；
 - 沖切輥在其具圓周上有切割刀；與
 - 衛生棉片行進到成對的砧輥與沖切輥之間，以將一片片的衛生棉逐一切下。
- 8.如申請專利範圍第6項所述之衛生產品製造設備，其中：
 - 衛生棉切割部包含成對的砧輥與沖切輥；
 - 沖切輥在其具圓周上有切割刀；與
 - 衛生棉片行進到成對的砧輥與沖切輥之間，以將一片片的衛生棉逐一切下。
- 9.如申請專利範圍第3項所述之衛生產品製造設備，其包裝裝置包含：
 - 縱長方向折疊部，其將衛生棉之本體的兩縱長方向末端部分折向衛生棉的正面側；
 - 防滑黏膠塗布部，在其前面行進著從滾筒所輸送之連續的包裝膜片，其一側塗有矽酮，且其將防滑黏膠在行進方向上

- 間隔塗到包裝膜片的矽酮塗層側上；
 - 重合部，其將衛生棉置於行進中的包裝膜片上的防滑黏膠上；
 - 翼部折疊部，其在包裝膜片之寬度方向上將行進中的包裝膜片連同衛生棉一起折疊，使衛生棉變成在包裝膜片內側，而衛生棉的兩翼部均被折疊；
 - 壓緊膠片貼附部，其將從其滾筒所輸送來的連續的壓緊膠帶切成壓緊膠片並將之在行進方向上間隔貼附到包裝膜片所相互部分重疊的邊緣上；
 - 封膜部，其在行進方向上間隔以熱密封一片片衛生棉之間的中間部分；與
 - 切斷部，其在一片片衛生棉的中間部分切斷包裝膜片。
- 10.如申請專利範圍第9項所述之衛生產品製造設備，其中：
 - 防滑黏膠塗布部將防滑黏膠塗到行進中的包裝膜片的矽酮塗層側上對應到衛生棉之本體的中間部分與縱長方向末端部分的位置上，與兩翼部上；與
 - 重合部，其將縱長方向末端部分被折在防滑黏膠上的衛生棉置於包裝膜片上，使衛生棉的反面與防滑黏膠接觸，本體的中間部分與衛生棉的翼部在位置上對應到包裝膜片上塗了防滑黏膠的配對部分。
 - 11.如申請專利範圍第9或10項所述之衛生產品製造設備，其中翼部折疊部包含：
 - 輸送輥，將其設定為可在垂直平面自由轉動；
 - 壓緊輥，其較包裝膜片窄，將其放置成低於輸送輥，且將其設定為可自由轉動；及
 - 折疊器；
 - 行進之包裝膜片，通過輸送輥上方、壓緊輥下方、及折疊器內部，在其寬度方向連續地被折疊，衛生棉之本體的縱長方向兩端部以包裝膜片上塗布了防滑黏

膠的配對部分覆蓋之。

- 12.如申請專利範圍第9或10項所述之衛生產品製造設備，其壓緊膠片貼附部包含：

壓緊膠片切斷子部，其將壓緊膠帶逐一切成壓緊膠片；與
貼附輥，其將壓緊膠片貼附到行進中的包裝膜片的邊緣。

- 13.如申請專利範圍第11項所述之衛生產品製造設備，其壓緊膠片貼附部包含：
壓緊膠片切斷子部，其將壓緊膠帶逐一切成壓緊膠片；與
貼附輥，其將壓緊膠片貼附到行進中的包裝膜片的邊緣。

圖式簡單說明：

第一圖為本發明之其中一型衛生產品之製造設備之一實施例的概略側視圖；

第二圖為顯示藉第一圖之製造設備的製造裝置對衛生棉的製造程序的流程圖；

第三圖為製造裝置之表層片黏膠塗布部、吸收體切割部、內襯片黏膠塗布部、重合部與熱封部的概略立體圖；

第四圖為製造裝置的重合部的概略

立體圖；

第五圖為製造裝置之熱封部及衛生棉切割部，與第一圖之製造設備之包裝裝置的縱長方向折疊部的概略立體圖；

第六圖為衛生棉的分解圖；

第七圖包裝裝置的概略立體圖；

第八圖為顯示藉包裝裝置對衛生棉的包裝過程以生產衛生產品的流程圖；

第九圖(A)顯示衛生棉的初始狀態；

10. 第九圖(B)則顯示其後的狀態；

第十圖為包裝裝置之封膜部及切斷部的概略立體圖；

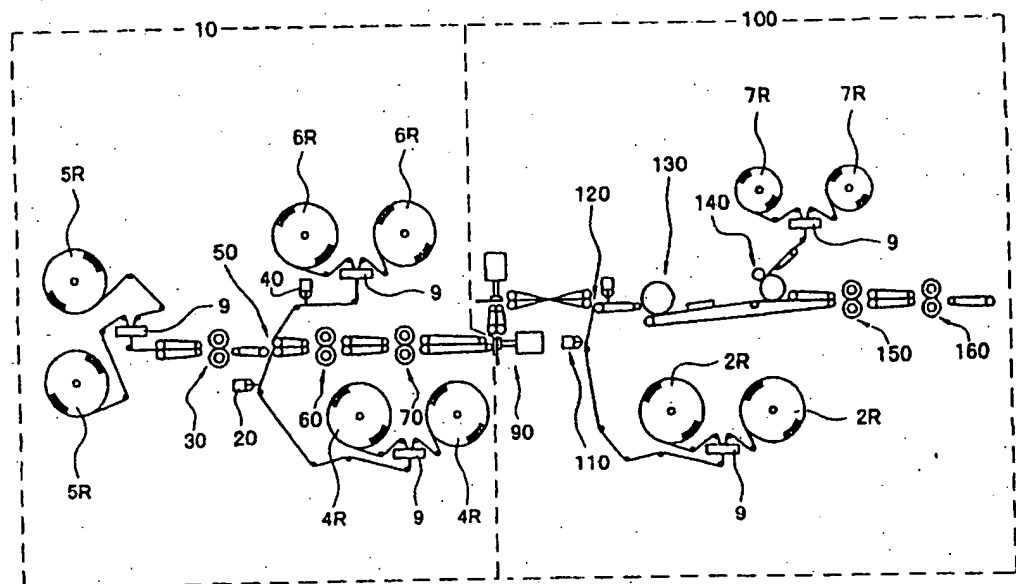
第十一圖(A)為衛生產品的概略立體圖；第十一圖(B)為其包裝膜打開後的概略立體圖；

15. 第十二圖為用於製造本發明之另一型吸收體的裝置的概略立體圖；

第十三圖(I)為習用的衛生產品的概略平面圖；第十三圖(II)為其包裝膜打開後的概略平面圖；

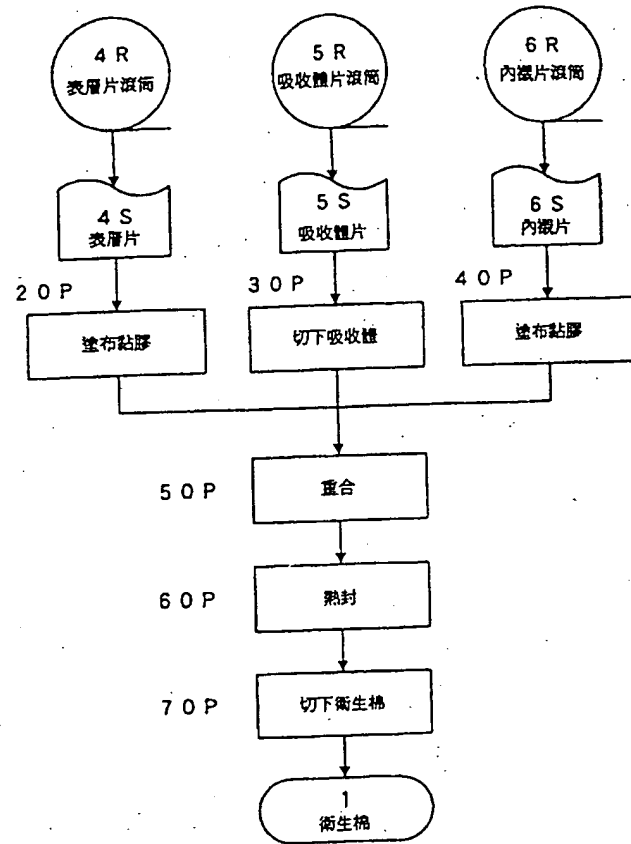
20. 第十四圖為習用的衛生產品的分解圖；與

第十五圖顯示習用的衛生棉的反面。

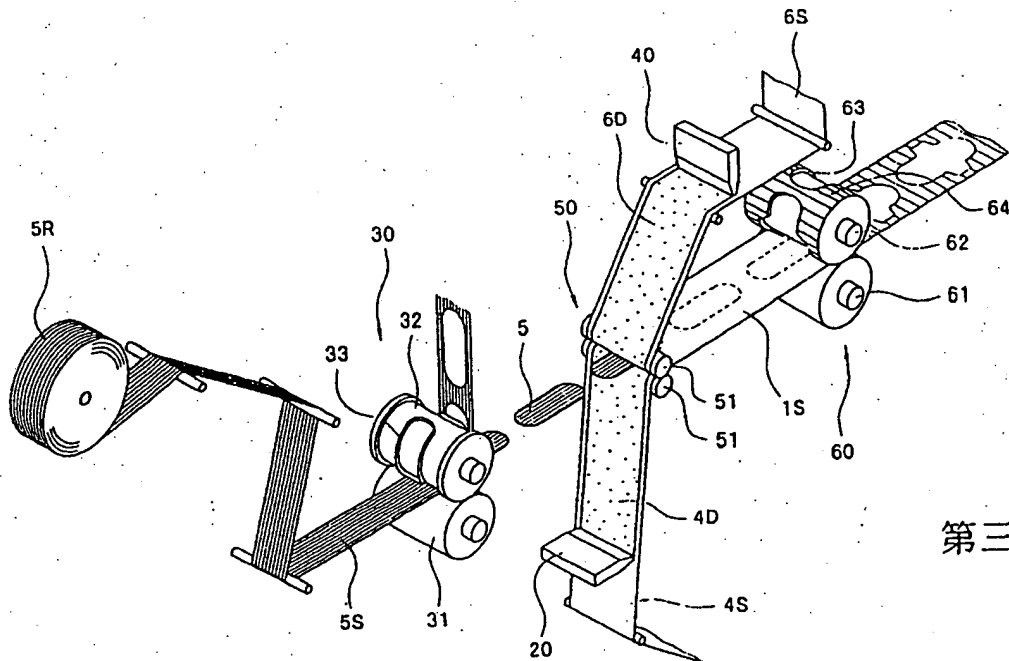


第一圖

(4)

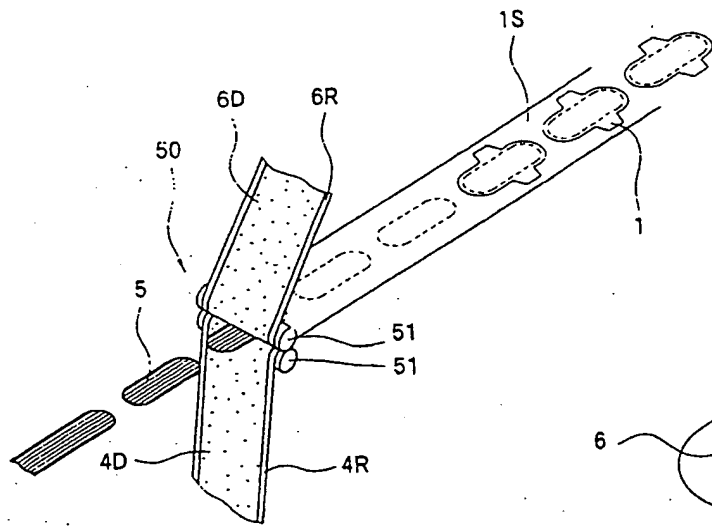


第二圖



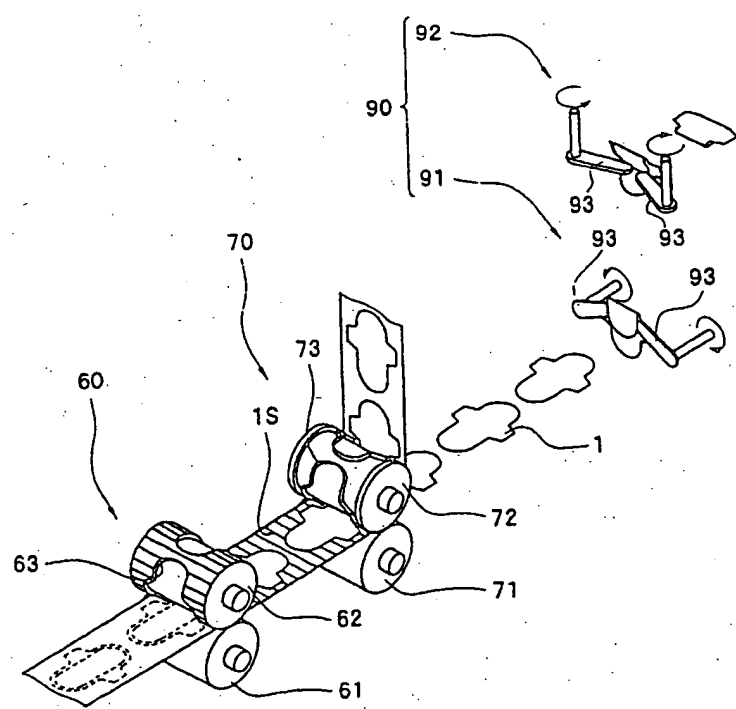
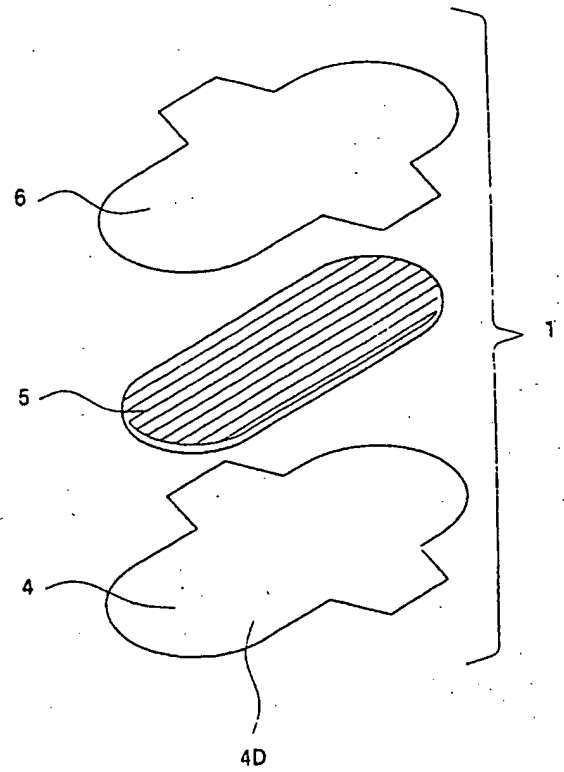
第三圖

(5)



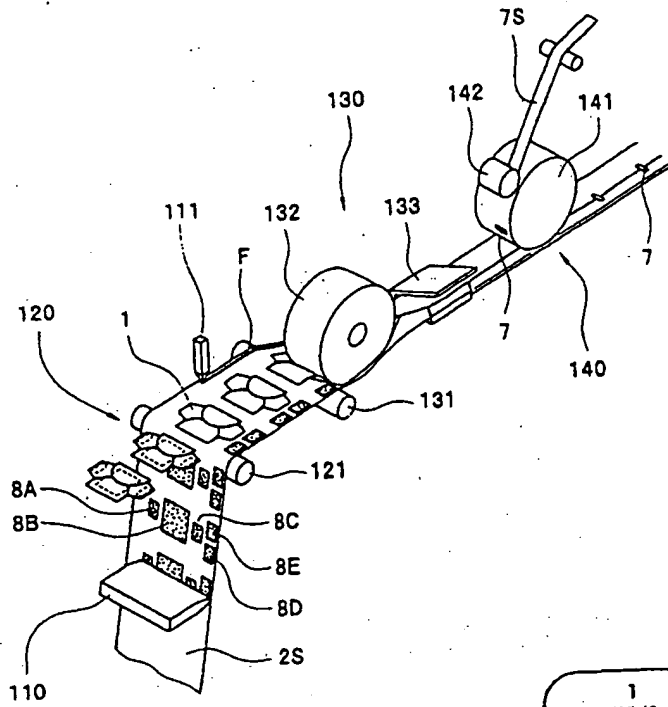
第四圖

第六圖

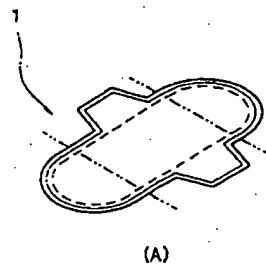


第五圖

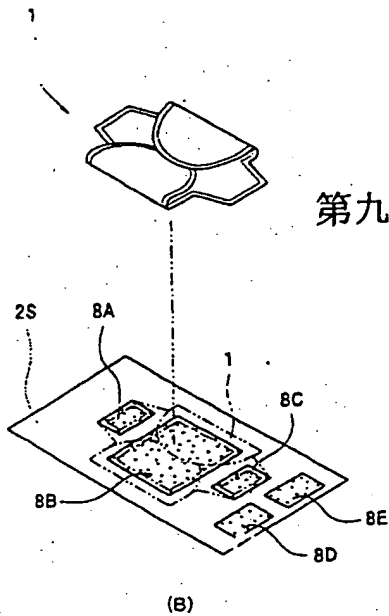
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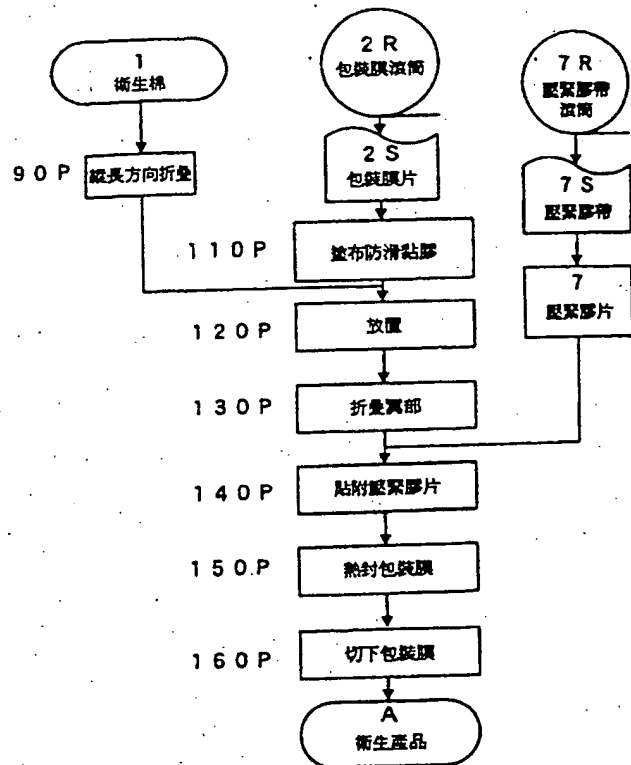
第七圖



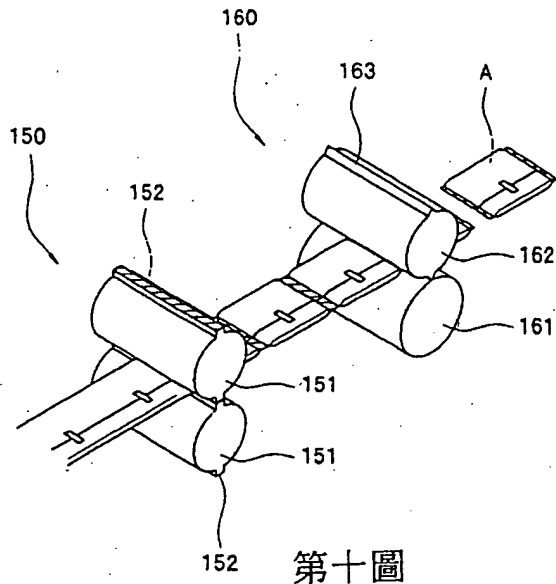
(A)



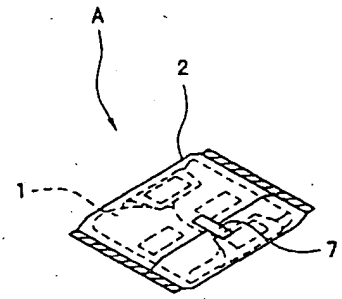
第九圖



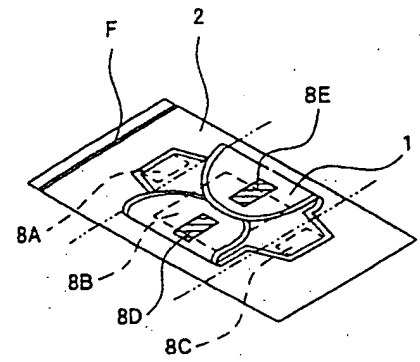
第八圖



第十圖

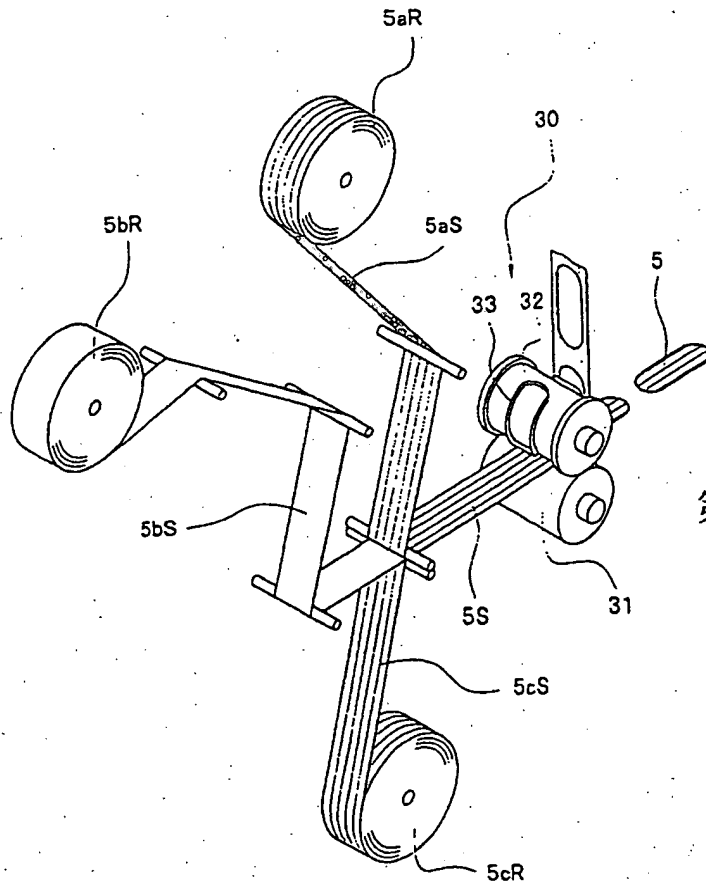


(I)



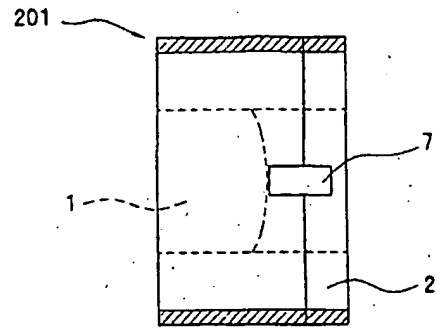
(II)

第十一圖



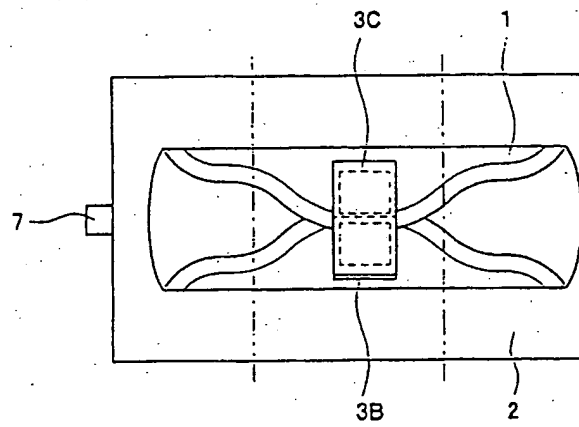
第十二圖

(8)

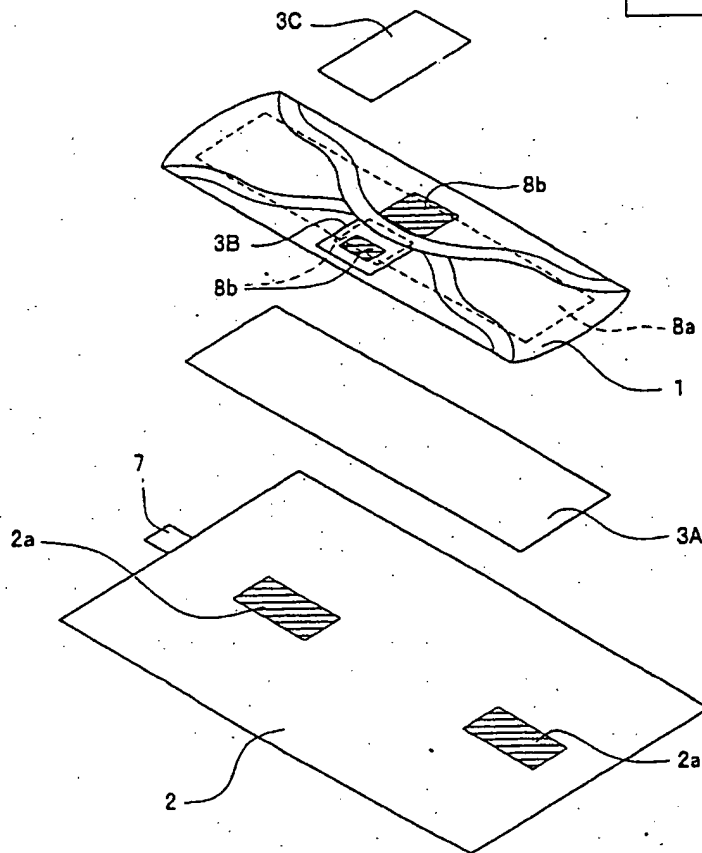


(I)

第十三圖

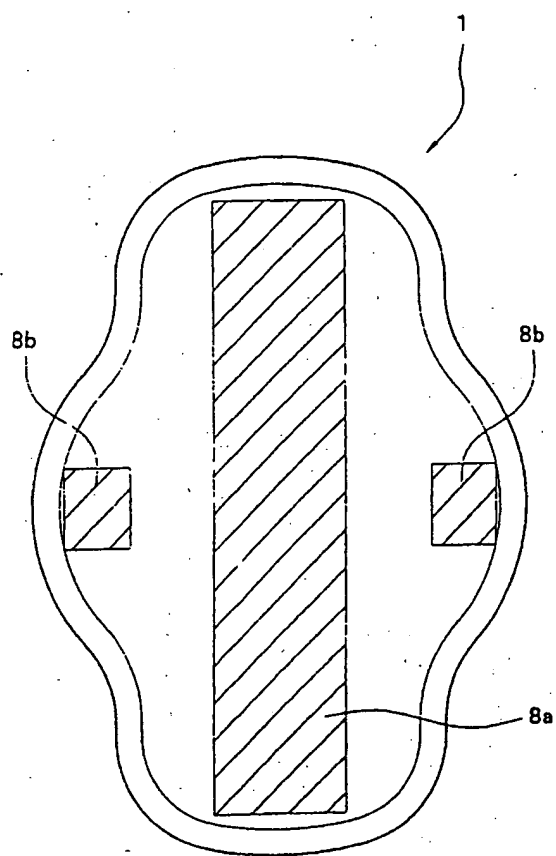


(II)



第十四圖

(9)



第十五圖

88 年 3 月 18 日修訂

修正

補充

本 88 年 3 月 18 日

SANITARY NAPKIN PRODUCT AND ITS MANUFACTURING EQUIPMENT

BACKGROUND OF THE INVENTION

5 The present invention relates to a sanitary napkin product and its manufacturing equipment.

Fig. 13 (I) is a plan view of a conventional sanitary napkin product 201; Fig. 13 (II), a plan view of the same of which the wrapping film 2 is open. Fig. 14 is an exploded view of the sanitary napkin product 201.

10 As shown in Figs. 13 and 14, the conventional sanitary napkin product 201 consists essentially of a wrapping film 2, a peeling-off paper strip 3A, a sanitary napkin 1, and peeling-off paper strips 3B and 3C, each put on another in the order of the description, the sanitary napkin 1 wrapped
15 in the wrapping film 2.

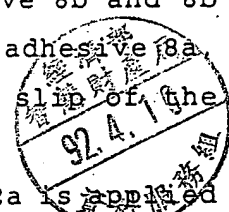
The numeral 7 indicates a hold-down tape strip.

Fig. 15 shows the back of the conventional sanitary napkin 1. As shown in Fig. 15, a wing is formed on each side of the body of the sanitary napkin 1. The leakage of a sanitary
20 napkin with wings is smaller than that of a sanitary napkin without wing. Therefore, consumers prefer sanitary napkins with wings.

On the back of the sanitary napkin 1, adhesive 8a is applied to the center portion extending in the direction
25 of length of the sanitary napkin 1, and adhesive 8b and 8b is applied to both the right and left wings. The adhesive 8a, 8b and 8b adheres to underwear to prevent the slip of the sanitary napkin 1 while it is used.

As shown in Fig. 14, adhesive 2a and 2a is applied
30 to the center portions of the inside of the wrapping film 2. The adhesive 2a and 2a of the wrapping film 2 is overlaid with the peeling-off paper strip 3A. Namely, the peeling-off paper strip 3A is affixed to the wrapping film 2. Then, the sanitary napkin 1 with its wings folded is put on the peeling-off paper
35 strip 3A. The peeling-off paper strip 3A prevents the sanitary

煩請委員明示，本申請案之實質內容



napkin 1 from sticking to the wrapping film 2 and thereby preserves the adhesion of the adhesive 8a.

The peeling-off paper strip 3E is inserted between the right and left wings, both folded and overlapping each other, of the sanitary napkin 1 to preserve the adhesion of the adhesive 8b of the wing positioned under the other. The adhesive 8b of the wing positioned on the other is overlaid with the peeling-off paper 3C, which prevents the sanitary napkin 1 from sticking to the wrapping film 2 and thereby preserves the adhesion of the adhesive 8b.

The wrapping film 2 together with the sanitary napkin 1 is folded in three along the dot-dash lines shown in Fig. 13 (II), each of the upper and lower hems of the wrapping film 2 making three layers of itself. Then, as shown in Fig. 13 (I), the upper and lower hems are heat-sealed and the hold-down tape strip 7 is affixed to the wrapping film 2 to produce the sanitary napkin product 201, the wrapping film 2 constituting the wrapper of the sanitary napkin 1.

To use the sanitary napkin 1 wrapped in the wrapping film 2, the hold-down tape strip 7 is removed, the wrapping film 2 of the sanitary napkin product 201 is opened, and the sanitary napkin 1 is peeled off the peeling-off paper strip 3A on the wrapping film 2. Then, the peeling-off paper strips 3C and 3B are peeled off the adhesive 8b and 8b. As mentioned earlier, the adhesion of the adhesive 8a, 8b and 8b of the sanitary napkin 1 is preserved. Therefore, the adhesive 8a, 8b and 8b prevent the sanitary napkin 1 from slipping while it is used.

In case of the conventional sanitary napkin product 201, the peeling-off paper strips 3A, 3B and 3C are necessary to preserve the adhesion of the adhesive 8a, 8b and 8b until the sanitary napkin 1 is used. However, when the sanitary napkin 1 is used, the peeling-off paper strips 3A, 3B and 3C as well as the wrapping film 2 are junked. Using the peeling-off paper strips 3A, 3B and 3C in the sanitary napkin product 201

increases the quantity of wastes and the material cost of the sanitary napkin product 201.

Besides, devices to overlay the adhesive 8a, 8b and 8b with the peeling-off paper strips 3A, 3B and 3C are required, which makes the manufacturing equipment of the sanitary napkin product 201 complex and large.

In accordance with the above, an object of the present invention is to provide a sanitary napkin product which requires no peeling-off paper strips, reducing the quantity of wastes and its material cost, and does not slip while it is used. Another object of the present invention is to provide a manufacturing equipment of the sanitary napkin product.

SUMMARY OF THE INVENTION

According to the first aspect of the present invention, there is provided a sanitary napkin product which is a sanitary napkin with wings on both sides of its body wrapped entirely in a wrapping film. The inside of the wrapping film is coated with silicone, and a coat of slip-preventing adhesive which comes easily off silicone coats is formed between the silicone-coated side of the wrapping film and the back of the sanitary napkin.

According to the second aspect of the present invention, there is provided a sanitary napkin product according to the first aspect wherein (i) both the longitudinal end parts of the body of the sanitary napkin are folded onto the front side of the sanitary napkin, (ii) the wings on both sides of the sanitary napkin are folded onto the front side of the sanitary napkin, and (iii) the slip-preventing adhesive is applied to the backs of the middle part and longitudinal end parts of the body, and the backs of the wings, of the sanitary napkin.

According to the third aspect of the present invention, there is provided a sanitary-napkin-product

manufacturing equipment which comprises (i) a manufacturing machine to manufacture a sanitary napkin with wings and (ii) a wrapping machine to apply slip-preventing adhesive, which comes easily off silicone coats, to the back of the sanitary napkin and wrap the sanitary napkin in a wrapping film, of which the inside is coated with silicone, to produce a sanitary napkin product.

According to the fourth aspect of the present invention, there is provided a sanitary-napkin-product manufacturing equipment according to the third aspect of which the manufacturing machine, wherein a continuous facing sheet fed from its roll, a continuous absorbent sheet fed from its roll, and a continuous lining sheet fed from its roll run respectively, comprises (i) an absorbent-body cutout unit which cuts out absorbent bodies one after another at intervals in the running direction from the running absorbent sheet, (ii) a lining-sheet-adhesive applying unit which applies adhesive to the running lining sheet continuously in the running direction, (iii) a facing-sheet-adhesive applying unit which applies adhesive to the running facing sheet continuously in the running direction, (iv) a sandwiching unit which puts the absorbent bodies sequentially between the running facing sheet and the running lining sheet and puts them together to make a sanitary napkin sheet, (v) a heat-sealing unit which seals with heat the portion inside and along the outline of the portion including the absorbent body which becomes the sanitary napkin, and (vi) a sanitary-napkin cutout unit which cuts out pieces of the sanitary napkin one after another at intervals from the sanitary napkin sheet holding the absorbent bodies inside.

According to the fifth aspect of the present invention, there is provided a sanitary-napkin-product manufacturing equipment according to the fourth aspect of which the absorbent-body cutout unit comprises paired anvil roller and die-cut roller. The die-cut roller has cutter

blades on its periphery to cut out absorbent bodies, and the absorbent sheet runs into between the paired anvil roller and die-cut roller for absorbent bodies to be cut out one after another.

5 According to the sixth aspect of the present invention, there is provided a sanitary-napkin-product manufacturing equipment according to the fourth or fifth aspect of which the heat-sealing unit comprises paired anvil roller and heat-sealing roller. The heat-sealing roller has
10 nonheating portions on its periphery, each a little smaller than the sanitary napkin, and the sanitary napkin sheet runs into between the paired anvil roller and heat-sealing roller.

 According to the seventh aspect of the present invention, there is provided a sanitary-napkin-product
15 manufacturing equipment according to the fourth, or fifth, or sixth aspect of which the sanitary-napkin cutout unit comprises paired anvil roller and die-cut roller. The die-cut roller has cutter blades on its periphery, and the sanitary napkin sheet runs into between the paired anvil roller and
20 die-cut roller for pieces of the sanitary napkin to be cut out one after another.

 According to the eighth aspect of the present invention, there is provided a sanitary-napkin-product manufacturing equipment according to the third aspect of which
25 the wrapping machine comprises (i) a longitudinally folding unit which folds both the longitudinal end parts of the body of the sanitary napkin onto the front side of the sanitary napkin, (ii) a slip-preventing-adhesive applying unit, in front of which a continuous wrapping film sheet with one side
30 coated with silicone fed from its roll runs, and which applies slip-preventing adhesive to the silicone-coated side of the wrapping film sheet at intervals in the running direction, (iii) an overlaying unit which puts the sanitary napkin on the slip-preventing adhesive on the running wrapping film
35 sheet, (iv) a wing-folding unit which folds the running

wrapping film sheet together with the sanitary napkin in the direction of width of the wrapping film sheet, the sanitary napkin held inside the wrapping film sheet, the wings of the sanitary napkin folded, (v) a hold-down-tape affixing unit which cuts a continuous hold-down tape fed from its roll into hold-down tape strips and affixes them at intervals in the running direction onto both the hems overlapping each other of the wrapping film sheet, (vi) a film-sealing unit which seals with heat the intermediate portions between pieces of the sanitary napkin at intervals in the running direction, and (vii) a cutting unit which cuts off the wrapping film sheet in the intermediate portions between pieces of the sanitary napkin.

According to the ninth aspect of the present invention, there is provided a sanitary-napkin-product manufacturing equipment according to the eighth aspect wherein (i) the slip-preventing-adhesive applying unit applies slip-preventing adhesive to such parts of the silicone-coated side of the running wrapping film sheet as correspond positionally to the middle part and longitudinal end parts of the body, and both the wings, of the sanitary napkin and (ii) the overlaying unit puts the sanitary napkin with its longitudinal end parts folded on the slip-preventing adhesive on the wrapping film sheet, the back of the sanitary napkin coming into contact with the slip-preventing adhesive, and the middle part of the body and the wings of the sanitary napkin corresponding positionally to the slip-preventing-adhesive-applied counterparts of the wrapping film sheet.

According to the tenth aspect of the present invention, there is provided a sanitary-napkin-product manufacturing equipment according to the eighth or ninth aspect of which the wing-folding unit comprises (i) a feed roller which is set freely rotatably in a vertical plane, (ii) a holding-down roller which is narrower than the wrapping film sheet, positioned lower than the feed roller, and set freely

rotatably, and (iii) a folder. The wrapping film sheet runs on the feed roller, under the holding-down roller, and through the folder to be folded widthwise continuously, the longitudinal end parts of the body of the sanitary napkin overlaid with the slip-preventing-adhesive-applied counterparts of the wrapping film sheet.

According to the eleventh aspect of the present invention, there is provided a sanitary-napkin-product manufacturing equipment according to eighth, or ninth, or tenth aspect of which the hold-down-tape affixing unit comprises (i) a hold-down-tape cutting subunit which cuts the hold-down tape into hold-down tape strips one after another, and (ii) an affixing roller which affixes the hold-down tape strips to the hems of the running wrapping film sheet.

In the present invention, the concept of sanitary napkin product includes pantie liner product, menstrual napkin product, maternity napkin product, and incontinent pad product at the least, and the concept of sanitary napkin includes pantie liner, menstrual napkin, maternity napkin, and incontinent pad at the least.

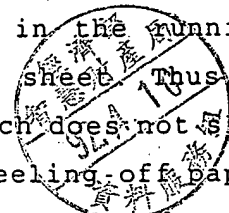
The advantages offered by the first aspect of the present invention are mainly as follows. The slip-preventing adhesive comes easily, without deterioration, off the silicone-coated surface of the wrapping film to stay on the back of the sanitary napkin. Accordingly, the positional slippage of the sanitary napkin can be prevented while it is used. Besides, no peeling-off paper is required, which reduces the quantity of wastes and the material cost of the sanitary napkin product.

The advantages offered by the second aspect of the present invention are mainly as follows. The slip-preventing adhesive comes easily, without deterioration, off the silicone-coated surface of the wrapping film to stay on the back of the sanitary napkin. Accordingly, the positional slippage of the sanitary napkin can be prevented while it is

used. Besides, no peeling-off paper is required, which reduces the quantity of wastes and the material cost of the sanitary napkin product. Moreover, because slip-preventing adhesive can be applied to only the necessary parts, the material cost
5 further decreases.

The advantages offered by the third aspect of the present invention are mainly as follows. The slip-preventing adhesive comes easily, without deterioration, off the silicone-coated surface of the wrapping film to stay on the
10 back of the sanitary napkin. Accordingly, the positional slippage of the sanitary napkin can be prevented while it is used. Besides, because no peeling-off paper is required, the quantity of wastes and the material cost of the sanitary napkin product are reduced.

The advantages offered by the fourth aspect of the present invention are mainly as follows. While a continuous facing sheet, a continuous absorbent sheet, and a continuous lining sheet fed from their rolls, respectively, are running, absorbent bodies are cut out sequentially at intervals in the
20 running direction from the running absorbent sheet by the absorbent-body cutout unit, and the facing and lining sheets are coated continuously in the running direction with adhesive by the facing-sheet-adhesive and lining-sheet-adhesive applying units, respectively. The running facing and lining
25 sheets are put together by the sandwiching unit, absorbent bodies held between them, the sheets and bodies constituting a sanitary napkin sheet. By the heat-sealing unit, the running sanitary napkin sheet is heat-sealed at the portion inside and along the outline of the portion including the absorbent
30 body which becomes the sanitary napkin. Then, pieces of the sanitary napkin are cut out at intervals in the running direction from the running sanitary napkin sheet. Thus, a sanitary napkin product can be produced which does not slip while it is used and does not require any peeling-off paper strips, reducing the quantity of wastes and its material cost.
35

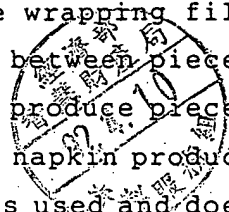


The advantage offered by the fifth aspect of the present invention is that absorbent bodies can be cut out from a running absorbent sheet sequentially.

5 The advantage offered by the sixth aspect of the present invention is that the area of a running sanitary napkin sheet around its absorbent bodies can be heat-sealed continuously without deteriorating the absorbent bodies.

10 The advantage offered by the seventh aspect of the present invention is that pieces of a sanitary napkin can be cut out one after another from a running sanitary napkin sheet.

The advantages offered by the eighth aspect of the present invention are mainly as follows. Both the longitudinal end parts of the body of a sanitary napkin are folded onto the front by the longitudinally folding unit. On the other
15 hand, a continuous wrapping film sheet fed from its roll and running is coated at intervals in its running direction with slip-preventing adhesive by the slip-preventing-adhesive applying unit. Pieces of the sanitary napkin are put on the slip-preventing adhesive on the running wrapping film sheet
20 by the overlaying unit. The running wrapping film sheet, together with the sanitary napkin, is folded in the direction of width of the wrapping film sheet by the wing-folding unit, the sanitary napkin inside the wrapping film sheet, both the wings of the sanitary napkin folded. In the hold-down tape affixing unit, a continuous hold-down tape fed from its roll
25 is cut into hold-down tape strips, which are affixed, at intervals in the running direction of the wrapping film sheet, to both the hems overlapping each other of the wrapping film sheet. The wrapping film sheet is heat-sealed, at intervals,
30 in the intermediate portions between pieces of the sanitary napkin by the film-sealing unit. Lastly, the wrapping film sheet is cut off in the intermediate portions between pieces of the sanitary napkin by the cutting unit to produce pieces of a sanitary napkin product. Thus, a sanitary napkin product
35 can be produced which does not slip while it is used and does



not require any peeling-off paper strips, reducing the quantity of wastes and its material cost.

The advantage offered by the ninth aspect of the present invention is as follows. Slip-preventing adhesive is applied to such parts of the silicone-coated side of a wrapping film sheet by the slip-preventing-adhesive applying unit as correspond positionally to the middle part and both the longitudinal end parts of the body, and both the wings, of a sanitary napkin. In the overlaying unit, the sanitary napkin with its wings folded is put on the slip-preventing adhesive on the wrapping film sheet, the back of the sanitary napkin coming into contact with the slip-preventing adhesive, the middle part of the body and the wings of the sanitary napkin corresponding positionally to their slip-preventing-adhesive-applied counterparts. Thus, a coat of slip-preventing adhesive can be formed between the back of the sanitary napkin with its wings folded and the silicone-coated side of the wrapping film sheet.

The advantage offered by the tenth aspect of the present invention is as follows. A running wrapping film sheet is pushed down together with the sanitary napkin by the holding-down roller to be given a U shape as seen in its running direction. Both the wings of the U consisting of the wrapping film sheet and the sanitary napkin are folded down by the folder. Thus, slip-preventing-adhesive-applied parts of the wrapping film sheet corresponding positionally to the longitudinal end parts of the body of the sanitary napkin are put on the latter.

The advantage offered by the eleventh aspect of the present invention is that a running hold-down tape is cut into hold-down tape strips by the hold-down-tape cutting subunit, which are affixed one after another by the affixing roller to the hems of the wrapping film sheet at intervals in the running direction of the wrapping film sheet.

BRIEF DESCRIPTION OF THE DRAWINGS

The features and advantages of the present invention will become more clearly appreciated from the following description in conjunction with the accompanying drawings, in which:

5 Fig. 1 is a schematic side view of an embodiment of manufacturing equipment of one form of sanitary napkin product of the present invention;

 Fig. 2 is a flowchart showing the manufacturing process of the sanitary napkin by the manufacturing machine
10 of the manufacturing equipment of Fig. 1;

 Fig. 3 is a schematic perspective view of the facing-sheet-adhesive applying unit, absorbent-body cutout unit, lining-sheet-adhesive applying unit, sandwiching unit, and heat-sealing unit of the manufacturing machine;

15 Fig. 4 is a schematic perspective view of the sandwiching unit of the manufacturing machine;

 Fig. 5 is a schematic perspective view of the heat-sealing unit and sanitary-napkin cutout unit of the manufacturing machine, and the longitudinally folding unit
20 of the wrapping machine of the manufacturing equipment of Fig. 1;

 Fig. 6 is an exploded view of the sanitary napkin;

 Fig. 7 is a schematic perspective view of the wrapping machine;

25 Fig. 8 is a flowchart showing the packing process of the sanitary napkin by the wrapping machine to produce the sanitary napkin product;

 Fig. 9 (A) shows the initial state of the sanitary napkin; Fig. 9 (B), the subsequent state;

30 Fig. 10 is a schematic perspective view of the film-sealing unit and cutting unit of the wrapping machine;

 Fig. 11 (A) is a schematic perspective view of the sanitary napkin product; Fig. 11 (B), a schematic perspective view of the same of which the wrapping film is open;

35 Fig. 12 is a schematic perspective view of a means

to manufacture another type of absorbent body of the present invention;

Fig. 13 (I) is a schematic plan view of a conventional sanitary napkin product; Fig. 13 (II), a
5 schematic plan view of the same of which the wrapping film is open;

Fig. 14 is an exploded view of the conventional sanitary napkin product; and

Fig. 15 shows the back of the conventional sanitary
10 napkin.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the drawings, a preferred embodiment of the present invention will now be described.

15 Fig. 1 is a schematic side view of an embodiment of manufacturing equipment of one form of sanitary napkin product of the present invention. As shown in Fig. 1, the manufacturing equipment of the sanitary napkin product comprises a manufacturing machine 10 (the left hand side in
20 Fig. 1) which manufactures the sanitary napkin such as pantie liner, menstrual napkin, maternity napkin, and incontinent pad and a wrapping machine 100 (the right hand side in Fig. 1) which wraps the sanitary napkin manufactured by the manufacturing machine 10 to produce the sanitary napkin
25 product, the two machines connected in series.

The manufacturing machine 10 of the sanitary napkin will first be described. The manufacturing machine 10 of the sanitary napkin, indicated by the numeral "1" in the relevant drawings, comprises a facing-sheet-adhesive applying unit 20,
30 an absorbent-body cutout unit 30, a lining-sheet-adhesive applying unit 40, a sandwiching unit 50, a heat-sealing unit 60, and a sanitary-napkin cutout unit 70.

Fig. 2 is a flowchart showing the manufacturing process of the sanitary napkin 1 by the manufacturing machine
35 10. The signs 20P-70P indicate the subprocesses of the units

20-70 of the manufacturing machine 10.

The signs 4R and 4R indicate facing sheet rolls; the signs 5R and 5R, absorbent sheet rolls; the signs 6R and 6R, lining sheet rolls. Two rolls are provided for each of the facing sheet 4S, absorbent sheet 5S, and lining sheet 6S so that each sheet can be fed by either roll through a corresponding connecting device 9 without interruption.

Each facing sheet roll 4R consists of a facing sheet 4S. The facing sheet 4S is of mesh film or nonwoven fabric.

Each absorbent sheet roll 5R consists of an absorbent sheet 5S. The absorbent sheet 5S is of dry-pulp nonwoven fabric containing polymer absorbent, or of dry-pulp nonwoven fabric overlaid with tissue paper.

Each lining sheet roll 6R consists of a lining sheet 6S. The lining sheet 6S is a film of synthetic resin.

The units 20-70 of the manufacturing machine 10 will now be described in detail.

The absorbent-body cutout unit 30 will be described first.

Fig. 3 is a schematic perspective view of the facing-sheet-adhesive applying unit 20, absorbent-body cutout unit 30, lining-sheet-adhesive applying unit 40, sandwiching unit 50, and heat-sealing unit 60. As shown in Fig. 3, the absorbent-body cutout unit 30 comprises paired, freely rotatable anvil roller 31 and die-cut roller 32.

Cutter blades 33 are formed on the periphery of the die-cut roller 32 at intervals in the direction of rotation of the die-cut roller 32.

Although two cutter blades 33 are formed on the die-cut roller 32 in Fig. 3, any number of cutter blades 33 without particular limitation may be formed.

Besides, although in Fig. 3 each cutter blade 33 is formed in a rectangular shape, of which the long sides are in the direction of rotation of the die-cut roller 32 and of which the short sides are rounded, it can dispense with

the long-side portions, consisting of only the short-side portions in a circular arc shape.

Moreover, cutter blades 33 may be formed in multiple rows in the direction of rotation of the die-cut roller 32 on the periphery of the die-cut roller 32. As the number of rows increases, the production quantity of the sanitary napkin 1 per unit time increases. Therefore, multiple-row arrangement of cutter blades 33 is preferable. The width of the die-cut roller 32 can be determined in accordance with the width of the absorbent sheet 5S. In case that the number of rows of cutter blades 33 is large, the absorbent sheet 5S will be widened. In case that the number of rows of cutter blades 33 is small, the absorbent sheet 5S will be narrowed.

The absorbent sheet 5S fed from an absorbent sheet roll 5R runs into between the paired anvil roller 31 and die-cut roller 32 of the absorbent-body cutout unit 30. The absorbent sheet 5S is running, and the paired anvil roller 31 and die-cut roller 32 are rotating synchronously with the running speed of the absorbent sheet 5S. Accordingly, each time a cutter blade 33 of the die-cut roller 32 meets the periphery of the anvil roller 31, an absorbent body 5 is cut out from the absorbent sheet 5S (30P). Absorbent bodies 5 thus cut out are fed to the sandwiching unit 50, which will be described later.

Alternatively, as shown in Fig. 12, sheets 5aS, 5bS and 5cS may be fed from sheet rolls 5aR, 5bR and 5cR and put together in layers to constitute an absorbent sheet 5S. These sheets 5aS, 5bS and 5cS constitute an equivalent for the "absorbent sheet" mentioned in claims of the present invention.

The facing-sheet-adhesive applying unit 20 will next be described.

The facing-sheet-adhesive applying unit 20 is a known nozzle. The facing-sheet-adhesive applying unit 20 is to apply adhesive 4D to the facing sheet 4S. Adhesive 4D can be applied continuously to the running facing sheet 4S by the

facing-sheet-adhesive applying unit 20 (20P).

Any adhesives such as hot melt adhesive, without particular limitation, can be used as the adhesive 4D. Besides, although the facing-sheet-adhesive applying unit 20 is shown as a nozzle in Fig. 3, it may be a transfer roller.

The lining-sheet-adhesive applying unit 40 will next be described.

As in the case of the facing-sheet-adhesive applying unit 20, the lining-sheet-adhesive applying unit 40 is a known nozzle. The lining-sheet-adhesive applying unit 40 is to apply adhesive 6D to the lining sheet 6S. Adhesive 6D can be applied continuously to the running lining sheet 6S by the lining-sheet-adhesive applying unit 40 (40P).

Any adhesives such as hot melt adhesive, without particular limitation, can be used as the adhesive 6D. Besides, although the lining-sheet-adhesive applying unit 40 is shown as a nozzle in Fig. 3, it may be a transfer roller.

The sandwiching unit 50 will next be described.

Fig. 4 is a schematic perspective view of the sandwiching unit 50. As shown in Figs. 3 and 4, the sandwiching unit 50 comprises a pair of rollers 51 and 51. The facing and lining sheets 4S and 6S holding absorbent bodies 5 between them run into between the paired rollers 51 and 51. Then, the facing and lining sheets 4S and 6S are pressed by the paired rollers 51 and 51 and stick to each other, absorbent bodies 5 held between them (50P).

The facing and lining sheets 4S and 6S holding absorbent bodies 5 between them will hereinafter be referred to as sanitary napkin sheet 1S.

The heat-sealing unit 60 will next be described.

As shown in Fig. 3, the heat-sealing unit 60 comprises paired anvil roller 61 and heat-sealing roller 62.

The heat-sealing roller 62 has a built-in heat source, which raises the temperature of the periphery of the heat-sealing roller 62. Nonheating portions 63 are formed in

the periphery of the heat-sealing roller 62. Each nonheating portion 63 is a recess, which is larger than the absorbent body 5 and given the shape of the winged sanitary napkin 1 so that the absorbent body 5 does not deteriorate from heat.

5 The non-recessed portion of the periphery of the heat-sealing roller 62 constitutes a heating portion 64.

The anvil roller 61 may also have a built-in heat source so that the heat-sealing temperature can be adjusted to heat-seal sanitary napkin sheets 1S of various materials.

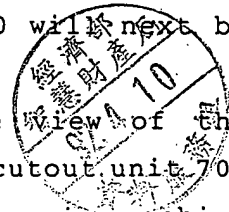
10 The width of the anvil roller 61 and heat-sealing roller 62 can be determined in accordance with the width of the sanitary napkin sheet 1S.

The sanitary napkin sheet 1S runs into between the anvil roller 61 and the heat-sealing roller 62 of the
15 heat-sealing unit 60. The sanitary napkin sheet 1S is running, and the anvil roller 61 and heat-sealing roller 62 are rotating synchronously with the running speed of the sanitary napkin sheet 1S. Accordingly, the area around each absorbent body 5 of the sanitary napkin sheet 1S (the hatched area shown in
20 Fig. 3) is caught between the anvil roller 61 and the heating portion 64 of the heat-sealing roller 62 and heat-sealed. On the other hand, each absorbent body 5 is accommodated in a nonheating portion 63 and, accordingly, does not deteriorate from heat. Thus, the heat-sealing unit 60 heat-seals the
25 sanitary napkin sheet 1S continuously without deteriorating absorbent bodies 5 (60P).

In Fig. 3, the hatched area of the sanitary napkin sheet 1S is heat-sealed, and the non-hatched portions are not heat-sealed.

30 The sanitary-napkin cutout unit 70 will be next described.

Fig. 5 is a schematic perspective view of the heat-sealing unit 60 and the sanitary-napkin cutout unit 70, and the longitudinally folding unit 90 of the wrapping machine
35 100. As shown in Fig. 5, the sanitary-napkin cutout unit 70



comprises paired anvil roller 71 and die-cut roller 72. Formed on the periphery of the die-cut roller 72 are cutter blades 73 in the shape of the winged sanitary napkin 1 and in a size larger than that of the nonheating portions 63 of the heat-sealing roller 62 of the heat-sealing unit 60.

The width of the anvil roller 71 and die-cut roller 72 can be determined in accordance with the width of the sanitary napkin sheet 1S.

The sanitary napkin sheet 1S runs into between the paired anvil roller 71 and die-cut roller 72 of the sanitary-napkin cutout unit 70. The sanitary napkin sheet 1S is running, and the paired anvil roller 71 and die-cut roller 72 are rotating synchronously with the running speed of the sanitary napkin sheet 1S. Accordingly, each time a cutter blade 73 of the die-cut roller 72 meets the periphery of the anvil roller 71, a piece of the sanitary napkin 1 is cut out from the sanitary napkin sheet 1S (70P). Pieces of the sanitary napkin 1 thus cut out are fed to the longitudinally folding unit 90 of the wrapping machine 100.

The sanitary napkin sheet 1S, after the sanitary napkin 1 is cut out from it, is wound up (not shown) and disposed of.

The manufacturing machine 10 of the sanitary napkin 1 with the above construction manufactures the sanitary napkin 1 as follows.

As shown in Figs. 2 and 3, the absorbent sheet 5S from an absorbent sheet roll 5R is fed into between the anvil roller 31 and die-cut roller 32 of the absorbent-body cutout unit 30, and absorbent bodies 5 are cut out one after another from the absorbent sheet 5S (30P).

On the other hand, the facing sheet 4S from a facing sheet roll 4R is fed to the facing-sheet-adhesive applying unit 20, where adhesive 4D is applied to the facing sheet 4S (20P).

The lining sheet 6S from a lining sheet roll 6R is

fed to the lining-sheet-adhesive applying unit 40, where adhesive 6D is applied to the lining sheet 6S (40P).

The facing-sheet 4S and the lining sheet 6S holding absorbent bodies 5 between them are fed to the sandwiching unit 50 and caught and pressed between the paired rollers 51 and 51 to become a sanitary napkin sheet 1S (50P).

The sanitary napkin sheet 1S is fed into between the anvil roller 61 and the heat-sealing roller 62 of the heat-sealing unit 60. The area around each absorbent body 5 of the sanitary napkin sheet 1S is caught between the anvil roller 61 and the heating portion 64 of the heat-sealing roller 62 and heat-sealed. On the other hand, each absorbent body 5 is accommodated in a nonheating portion 63 of the heat-sealing roller 62 and, accordingly, does not deteriorate from heat. Thus, the sanitary napkin sheet 1S can be heat-sealed continuously, without deteriorating absorbent bodies 5, by the heat-sealing unit 60 (60P).

As shown in Fig. 5, the sanitary napkin sheet 1S is fed into between the anvil roller 71 and die-cut roller 72 of the sanitary-napkin cutout unit 70, where each time a cutter blade 73 of the die-cut roller 72 meets the periphery of the anvil roller 71, a piece of sanitary napkin 1 is cut out from the sanitary napkin sheet 1S (70P).

Fig. 6 is an exploded view of the sanitary napkin 1.

As is shown in Fig. 6, the sanitary napkin 1 manufactured by the manufacturing machine 10 has wings, and adhesive 4D is applied to the inside of the facing 4. The sanitary napkin 1 with wings may simply be referred to as sanitary napkin 1 in the present invention. Although the same numeral "1" is used to indicate both the sanitary napkin of the present embodiment and the conventional sanitary napkin shown in Figs. 13 to 15, they are different from each other.

As the adhesive 4D is applied to all the inside of the facing of the sanitary napkin 1, positional slippage of

the absorbent body is prevented and, hence, longitudinal and lateral leaks of catamenial flux and so on are prevented. Namely, longitudinal and lateral leaks of liquid such as catamenial flux can be prevented by the adhesive 4D.

5 The wrapping machine 100 will next be described.

As shown in Fig. 1, the wrapping machine 100 comprises a longitudinally folding unit 90, a slip-preventing-adhesive applying unit 110, an overlaying unit 120, a wing-folding unit 130, a hold-down-tape affixing unit 140, 10 a film-sealing unit 150, and a cutting unit 160.

Fig. 8 is a flowchart of the wrapping process of the sanitary napkin 1 by the wrapping machine 100.

In Fig. 8, the signs 90P and 110P to 160P indicate the subprocesses by the units 90 and 110 to 160 of the wrapping 15 machine 100.

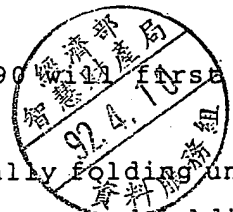
The signs 2R and 2R indicate a wrapping film roll each. The signs 7R and 7R indicate a hold-down tape roll each. Two rolls are provided for each of the wrapping film sheet 2S and the hold-down tape 7S so that the material can be fed 20 by either roll through a corresponding connecting device 9 without interruption.

Each wrapping film roll 2R consists of a wrapping film sheet 2S. The wrapping film sheet 2S is of a thermoplastic resin such as polyethylene, polyolefin, or vinyl chloride, 25 and its one side is coated with silicone. Each hold-down tape roll 7R consists of a hold-down tape 7S, which is of a petrochemical.

The units 90 and 110 to 160 of the wrapping machine 100 will now be described.

30 The longitudinally folding unit 90 will first be described.

As shown in Fig. 5, the longitudinally folding unit 90 comprises a first folding mechanism 91 and a second folding mechanism 92. Each of the first and second folding mechanisms 35 91 and 92 comprises a pair of folding arms 93 and 93. Each



folding arm 93 comprises a shaft and an arm. The base end of the arm is fixed to the shaft, both making a right angle.

The difference between the first and second folding mechanisms 91 and 92 is that the shafts of the first folding mechanism 91 are arranged horizontally, whereas those of the second folding mechanism 92 are arranged vertically.

Fig. 9 shows two states of the sanitary napkin 1. Fig. 9 (A) shows the initial state; Fig. 9 (B), the subsequent state. The sanitary napkin 1 fed to the longitudinally folding unit 90 is folded in two at one of the two dash-double dot lines shown in Fig. 9 (A) and again folded in two at the other. In this way, both the longitudinal end parts of the sanitary napkin 1 are folded as shown in Fig. 9(B) (90P).

The slip-preventing-adhesive applying unit 110 will next be described.

Fig. 7 is a schematic perspective view of the wrapping machine 100. As shown in Fig. 7, the slip-preventing-adhesive applying unit 110 is a nozzle to apply slip-preventing adhesive 8A, 8B, 8C, 8D and 8E to the silicone-coated side of the wrapping film sheet 2S. Adhesives such as hot melt adhesive can be used as the adhesive 8A, 8B, 8C, 8D and 8E.

The signs 8A and 8C indicate adhesive to prevent the slippage of the wings of the sanitary napkin 1.

The sign 8B indicates adhesive to prevent the slippage of the middle part of the body of the sanitary napkin 1.

The signs 8D and 8E indicate adhesive to prevent the slippage of both the longitudinal end parts of the body of the sanitary napkin 1.

Because the packing film sheet 2S is running, slip-preventing adhesive 8A, 8B, 8C, 8D and 8E can be applied onto the packing film sheet 2S at regular intervals by ejecting adhesive regularly from the slip-preventing-adhesive applying unit 110 (110P).

The overlaying unit 120 will next be described.

In the overlaying unit 120, a feed roller 121 is provided freely rotatably in a vertical plane. As shown in Fig. 9(B), in the overlaying unit 120, the slip-preventing adhesive 8A, 8B and 8C on the running wrapping film sheet 2S is overlaid with the sanitary napkin 1 which is folded by the longitudinally folding unit 90. Because pieces of the sanitary napkin 1 are sequentially fed and the wrapping film sheet 2S is running, pieces of the sanitary napkin 1 are sequentially put on the slip-preventing adhesive 8A, 8B and 8C on the wrapping film sheet 2S (120P).

A sealant-applying unit 111 is arranged above the running wrapping film sheet 2S. The sealant-applying unit 111 is a nozzle to apply sealant F, in the running direction, to the hem, on the opposite side of the slip-preventing adhesive 8D and 8E, of the running wrapping film sheet 2S.

Because the wrapping film sheet 2S is running, sealant F can be applied in a straight line to the hem of the wrapping film sheet 2S by ejecting sealant F continuously from the sealant-applying unit 111.

The sealant-applying unit 111 is not an essential constituent of the wrapping machine 100 of the manufacturing equipment of the sanitary napkin product of the present embodiment. However, applying sealant F to the wrapping film sheet 2S by the sealant-applying unit 111 is preferable because the wrapping film sheet 2S bearing sealant F can be sealed up by the wing-folding unit 130, which will be described later.

The wing-folding unit 130 will next be described.

As shown in Figs. 7 and 8, the wing-folding unit 130 comprises a feed roller 131, a holding-down roller 132, and a folder 133. The feed roller 131 is known in the art and set freely rotatably in a vertical plane. The holding-down roller 132 is narrower than the wrapping film sheet 2S and provided freely rotatably in a vertical plane in such a

position as presses down the center portion of the wrapping film sheet 2S between the feed roller 131 and the folder 133 to give it a flat-bottomed U shape as seen in the running direction of the wrapping film sheet 2S. The folder 133, a
5 known device in the art, is to fold down the wings of the U-shaped wrapping film sheet 2S.

In this way, the wing-folding unit 130 folds the wrapping film sheet 2S together with the sanitary napkin 1, the sanitary napkin 1 inside the wrapping film sheet 2S, both
10 the wings of the sanitary napkin 1 folded (130P).

The hold-down-tape affixing unit 140 will next be described.

The hold-down-tape affixing unit 140 comprises an affixing roller 141 and a cutter 142, the latter being an
15 example of the "hold-down-tape cutting subunit" mentioned in claims of the present invention. The affixing roller 141 is provided freely rotatably in a vertical plane. The cutter 142 is to cut off the hold-down tape 7S and positioned adjointly to the affixing roller 141.

20 The affixing roller 141 rotates synchronously with the running speed of the wrapping film sheet 2S.

The hold-down tape 7S fed from a hold-down tape roll 7R is cut by the cutter 142 into hold-down tape strips 7, which stick to the periphery of the affixing roller 141. Each
25 hold-down tape strip 7 carried on the turning affixing roller 141 comes into contact with, and sticks to, the wrapping film sheet 2S (140P).

The film-sealing unit 150 will next be described.

Fig. 10 is a schematic perspective view of the film-sealing unit 150 and the cutting unit 160. As shown in
30 Fig. 10, the film-sealing unit 150 comprises a pair of heat-sealing rollers 151 and 151. Each heat-sealing roller 151 has heating portions 152 on its periphery.

Although each heat-sealing roller 151 is provided
35 with two heating portions 152 in Fig. 10, any number of heating

portions 152 without particular limitation may be formed on the periphery of each heat-sealing roller 151.

The wrapping film sheet 2S is fed into between the paired heat-sealing rollers 151 and 151 to be heat-sealed in the intermediate portions between pieces of the sanitary napkin 1 (150P).

The cutting unit 160 will next be described.

The cutting unit 160 comprises freely rotatable, paired anvil roller 161 and rotary cutter 162. Cutter blades 163 are provided on the periphery of the rotary cutter 162.

The wrapping film sheet 2S runs into between the paired anvil roller 161 and rotary cutter 162 of the cutting unit 160. The wrapping film sheet 2S is running, and the anvil roller 161 and the rotary cutter 162 are rotating synchronously with the running speed of the wrapping film sheet 2S. Accordingly, each time a cutter blade 163 of the rotary cutter 162 meets the periphery of the anvil roller 161, the wrapping film sheet 2S is cut off to produce a piece of sanitary napkin product A (160P).

The width of the anvil roller 161 and rotary cutter 162 can be determined in accordance with the width of the wrapping film sheet 2S.

Given the above construction, the wrapping machine 100 wraps the sanitary napkin 1 in the wrapping film sheet 2S, as follows, to produce the sanitary napkin product A.

The pieces of the sanitary napkin 1 manufactured in sequence by the manufacturing machine 10 is fed to, and folded by, the longitudinally folding unit 90 (90P).

On the other hand, the slip-preventing-adhesive applying unit 110 applies adhesive 8A, 8B, 8C, 8D and 8E to the wrapping film sheet 2S fed from a wrapping film roll 2R (110P).

The adhesive 8A, 8B, 8C on the running wrapping film sheet 2S is overlaid with the sanitary napkin 1 (120P).

The sealant-applying unit 111 applies sealant F,

in a straight line in the running direction of the wrapping film sheet 2S, to the hem, on the opposite side of the slip-preventing adhesive 8D and 8E, of the wrapping film sheet 2S.

5 The holding-down roller 132 of the wing-folding unit 130 forms the running wrapping film sheet 2S together with the sanitary napkin 1 into a flat-bottomed U shape as seen in the running direction of the wrapping film sheet 2S, the sanitary napkin 1 inside the wrapping film sheet 2S, both
10 the wings of the sanitary napkin 1 folded upward. Then, the folder 133 folds down the wing, on the side of the slip-preventing adhesive 8D and 8E, of the U consisting of the wrapping film sheet 2S and the sanitary napkin 1. Immediately thereafter, the folder 133 folds down the wing, on the side
15 of the sealant F, of the U consisting of the wrapping film sheet 2S and the sanitary napkin 1 (130P). Thus, the wrapping film sheet 2S is sealed up by the sealant F.

 The cutter 142 of the hold-down-tape affixing unit 140 cuts the hold-down tape 7S fed from a hold-down tape roll
20 7R into hold-down tape strips 7, which stick to the periphery of the affixing roller 141. The affixing roller 141 turns and affixes the hold-down tape strips 7 onto the running wrapping film sheet 2S at regular intervals (140P).

 The wrapping film sheet 2S is fed into between the
25 paired heat-sealing rollers 151 and 151, and the intermediate portions between pieces of the sanitary napkin 1 are heat-sealed sequentially (150P).

 Lastly, the wrapping film sheet 2S is fed into between the paired anvil roller 161 and rotary cutter 162.
30 Each time a cutter blade 163 meets the periphery of the anvil roller 161, the wrapping film sheet 2S is cut off to produce a piece of the sanitary napkin product A (160P).

 In this way, pieces of the sanitary napkin 1 with
wings are wrapped sequentially in a wrapping film sheet 2S,
35 and pieces of the sanitary napkin product A are produced.

sequentially.

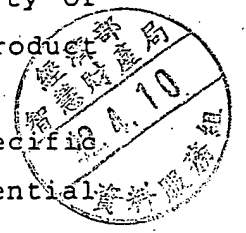
Fig. 11 (I) is a schematic perspective view of the sanitary napkin product A manufactured by the manufacturing equipment of the present embodiment; Fig. 11 (II), a schematic perspective view of the sanitary napkin product A, of which the wrapping film 2 is open. As shown in Fig. 11 (I), the sanitary napkin product A is a sanitary napkin 1 with wings which is wrapped entirely in a wrapping film 2. The inside of the wrapping film 2 is coated with silicone. A coat of the slip-preventing adhesive 8A, 8B, 8C, 8D and 8E, which comes easily off silicone coats, is formed between the silicone-coated side of the wrapping film sheet 2S and the back of the sanitary napkin 1.

To take out the sanitary napkin 1 from the wrapping film 2, pull the hold-down tape 7, and the wrapping film 2 will tears along the portion of sealant F and further along the heat-sealed hems.

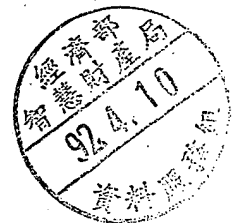
In the meantime, the adhesive 8D and 8E on the wrapping film 2 comes off the wrapping film 2 to stay on the backs of the longitudinal end parts of the sanitary napkin 1. Then, tear the sanitary napkin 1 off the wrapping film 2, and the adhesive 8A and 8C and the adhesive 8B on the wrapping film 2 will come off the wrapping film 2 to stay on the backs of the wings, and the back of the middle part of the body, of the sanitary napkin 1, respectively. Thus, when the sanitary napkin 1 is used, the adhesive 8A, 8B, 8C, 8D and 8E on the back of the sanitary napkin 1 adheres to underwear to prevent the positional slippage of the sanitary napkin 1.

Besides, no peeling-off paper is used in the sanitary napkin product A, which reduces the quantity of wastes and the production cost of the sanitary napkin product A.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are



therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and
5 range of equivalency of the claims are therefore intended to be embraced therein.



WHAT I CLAIM IS:

1 1. A sanitary napkin product being a sanitary napkin
2 with wings on both sides of its body wrapped entirely in a
3 wrapping film, wherein:

4 the inside of the wrapping film is coated with
5 silicone; and

6 a coat of slip-preventing adhesive, which comes
7 easily off silicone coats, is formed between the silicone-
8 coated side of the wrapping film and the back of the sanitary
9 napkin.

10 2. A sanitary napkin product as claimed in claim
11 1 wherein:

12 both the longitudinal end parts of the body of the
13 sanitary napkin are folded down onto the front side of the
14 sanitary napkin;

15 both the wings of the sanitary napkin are folded
16 down onto the front side of the sanitary napkin; and

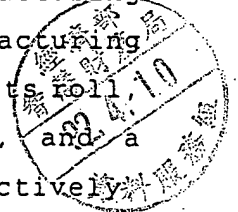
17 the slip-preventing adhesive is applied to the
18 backs of the middle part and longitudinal end parts of the
19 body, and the backs of the wings, of the sanitary napkin.

20 3. A sanitary-napkin-product manufacturing
21 equipment comprising:

22 a manufacturing machine to manufacture a sanitary
23 napkin with wings; and

24 a wrapping machine to apply slip-preventing
25 adhesive, which comes easily off silicone coats, to the back
26 of the sanitary napkin and wrap the sanitary napkin in a
27 wrapping film, of which the inside is coated with silicone,
28 to produce a sanitary napkin product.

29 4. A sanitary-napkin-product manufacturing
30 equipment as claimed in claim 3 of which the manufacturing
31 machine, wherein a continuous facing sheet fed from its roll
32 a continuous absorbent sheet fed from its roll, and a
33 continuous lining sheet fed from its roll run respectively
34 comprises:



1 an absorbent-body cutout unit which cuts out ab-
2 sorbent bodies one after another at intervals in the running
3 direction from the running absorbent sheet;
4 a lining-sheet-adhesive applying unit which
5 applies adhesive to the running lining sheet continuously in
6 the running direction;
7 a facing-sheet-adhesive applying unit which
8 applies adhesive to the running facing sheet continuously in
9 the running direction;
10 a sandwiching unit which puts the absorbent bodies
11 sequentially between the running facing sheet and the running
12 lining sheet and puts them together to make a sanitary napkin
13 sheet;
14 a heat-sealing unit which seals with heat the
15 portion inside and along the outline of the portion including
16 the absorbent body which becomes the sanitary napkin; and
17 a sanitary-napkin cutout unit which cuts out pieces
18 of the sanitary napkin one after another at intervals from
19 the sanitary napkin sheet holding the absorbent bodies inside.
20 5. A sanitary-napkin-product manufacturing
21 equipment as claimed in claim 4 wherein:
22 the absorbent-body cutout unit comprises paired
23 anvil roller and die-cut roller;
24 the die-cut roller has cutter blades on its
25 periphery to cut out absorbent bodies; and
26 the absorbent sheet runs into between the paired
27 anvil roller and die-cut roller for absorbent bodies to be
28 cut out one after another.
29 6. A sanitary-napkin-product manufacturing
30 equipment as claimed in claim 4 or 5 wherein:
31 the heat-sealing unit comprises paired anvil roller
32 and heat-sealing roller;
33 the heat-sealing roller has nonheating portions on
34 its periphery, each a little smaller than the sanitary napkin
35 and



1 the sanitary napkin sheet runs into between the
2 paired anvil roller and heat-sealing roller.

3 7. A sanitary-napkin-product manufacturing
4 equipment as claimed in claim 4 or 5 wherein:

5 the sanitary-napkin cutout unit comprises paired
6 anvil roller and die-cut roller;

7 the die-cut roller has cutter blades on its
8 periphery; and

9 the sanitary-napkin sheet runs into between the
10 paired anvil roller and die-cut roller for pieces of the sanitary
11 napkin to be cut out one after another.

12 8. A sanitary-napkin-product manufacturing
13 equipment as claimed in claim 6 wherein:

14 the sanitary-napkin cutout unit comprises paired
15 anvil roller and die-cut roller;

16 the die-cut roller has cutter blades on its
17 periphery; and

18 the sanitary-napkin sheet runs into between the
19 paired anvil roller and die-cut roller for pieces of the sanitary
20 napkin to be cut out one after another.

21 9. A sanitary-napkin-product manufacturing
22 equipment as claimed in claim 3 of which the wrapping
23 machine comprises:

24 a longitudinally folding unit which folds both the
25 longitudinal end parts of the body of the sanitary napkin onto
26 the front side of the sanitary napkin;

27 a slip-preventing-adhesive applying unit, in front of
28 which a continuous wrapping film sheet with one side coated
29 with silicone fed from its roll runs, and which applies slip-
30 preventing adhesive to the silicone-coated side of the wrapping
31 film sheet at intervals in the running direction;

32 an overlaying unit which puts the sanitary napkin on
33 the slip-preventing adhesive on the running wrapping film
34 sheet;

35 a wing-folding unit which folds the running wrapping

1 film sheet together with the sanitary napkin in the direction of
2 width of the wrapping film sheet, the sanitary napkin inside the
3 wrapping film sheet, both the wings of the sanitary napkin
4 folded;

5 a hold-down-tape affixing unit which cuts a con-
6 tinuous hold-down tape fed from its roll into hold-down tape
7 strips and affixes them at intervals in the running direction
8 onto both the hems overlapping each other of the wrapping
9 film sheet;

10 a film-sealing unit which seals with heat the
11 intermediate portions between pieces of the sanitary napkin at
12 intervals in the running direction; and

13 a cutting unit which cuts off the wrapping film sheet
14 in the intermediate portions between pieces of the sanitary
15 napkin.

16 10. A sanitary-napkin-product manufacturing
17 equipment as claimed in claim 9 wherein:

18 the slip-preventing-adhesive applying unit applies
19 slip-preventing adhesive to such parts of the silicone-coated
20 side of the running wrapping film sheet as correspond
21 positionally to the middle part and longitudinal end parts of
22 the body, and both the wings, of the sanitary napkin; and

23 the overlaying unit puts the sanitary napkin with its
24 longitudinal end parts folded on the slip-preventing adhesive
25 on the wrapping film sheet, the back of the sanitary napkin
26 coming into contact with the slip-preventing adhesive, the
27 middle part of the body and the wings of the sanitary napkin
28 corresponding positionally to the slip-preventing-adhesive-
29 applied counterparts of the wrapping film sheet.

30 11. A sanitary-napkin-product manufacturing
31 equipment as claimed in claim 9 or 10 wherein the wing-
32 folding unit comprises:

33 a feed roller which is set freely rotatably in a vertical
34 plane;

35 a holding-down roller which is narrower than the

1 wrapping film sheet, positioned lower than the feed roller, and
2 set freely rotatably; and

3 a folder,

4 the wrapping film sheet running on the feed roller,
5 under the holding-down roller, and through the folder to be
6 folded widthwise continuously, the longitudinal end parts of
7 the body of the sanitary napkin overlaid with the slip-
8 preventing-adhesive-applied counterparts of the wrapping film
9 sheet.

10 12. A sanitary-napkin-product manufacturing
11 equipment as claimed in claim 9 or 10 of which the hold-
12 down-tape affixing unit comprises:

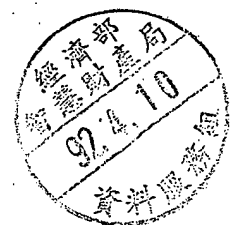
13 a hold-down-tape cutting subunit which cuts the
14 hold-down tape into hold-down tape strips one after another;
15 and

16 an affixing roller which affixes the hold-down tape
17 strips to the hems of the running wrapping film sheet.

18 13. A sanitary-napkin-product manufacturing
19 equipment as claimed in claim 11 of which the hold-down-tape
20 affixing unit comprises:

21 a hold-down-tape cutting subunit which cuts the
22 hold-down tape into hold-down tape strips one after another;
23 and

24 an affixing roller which affixes the hold-down tape
25 strips to the hems of the running wrapping film sheet.



ABSTRACT OF THE DISCLOSURE

A sanitary-napkin-product manufacturing equipment comprising (i) a manufacturing machine of a sanitary napkin with wings and (ii) a wrapping machine 100 to apply slip-preventing adhesive, which comes easily off silicone coats, to the back of the sanitary napkin and wrap the sanitary napkin in a wrapping film, of which the inside is coated with silicone, to produce a sanitary napkin product. The manufacturing machine comprises a facing-sheet-adhesive applying unit, an absorbent-body cutout unit, a lining-sheet-adhesive applying unit, a sandwiching unit, a heat-sealing unit, and a sanitary-napkin cutout unit. The wrapping machine comprises a longitudinally folding unit, a slip-preventing-adhesive applying unit, an overlaying unit, a wing-folding unit, a hold-down-tape affixing unit, a film-sealing unit, and a cutting unit.



FIG. 1

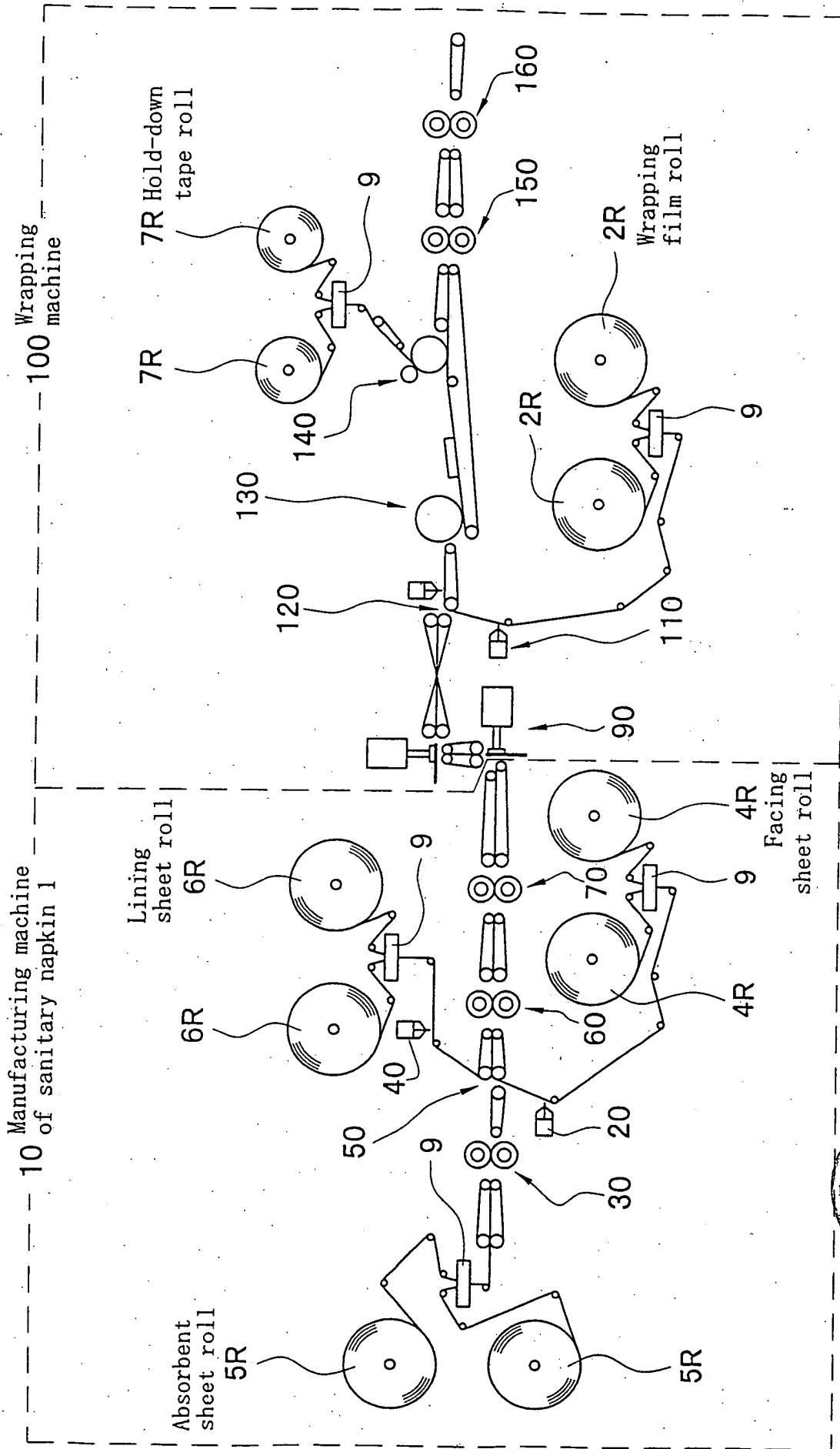


FIG. 2

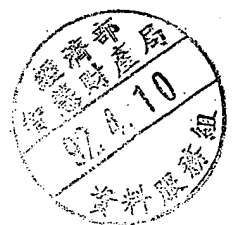
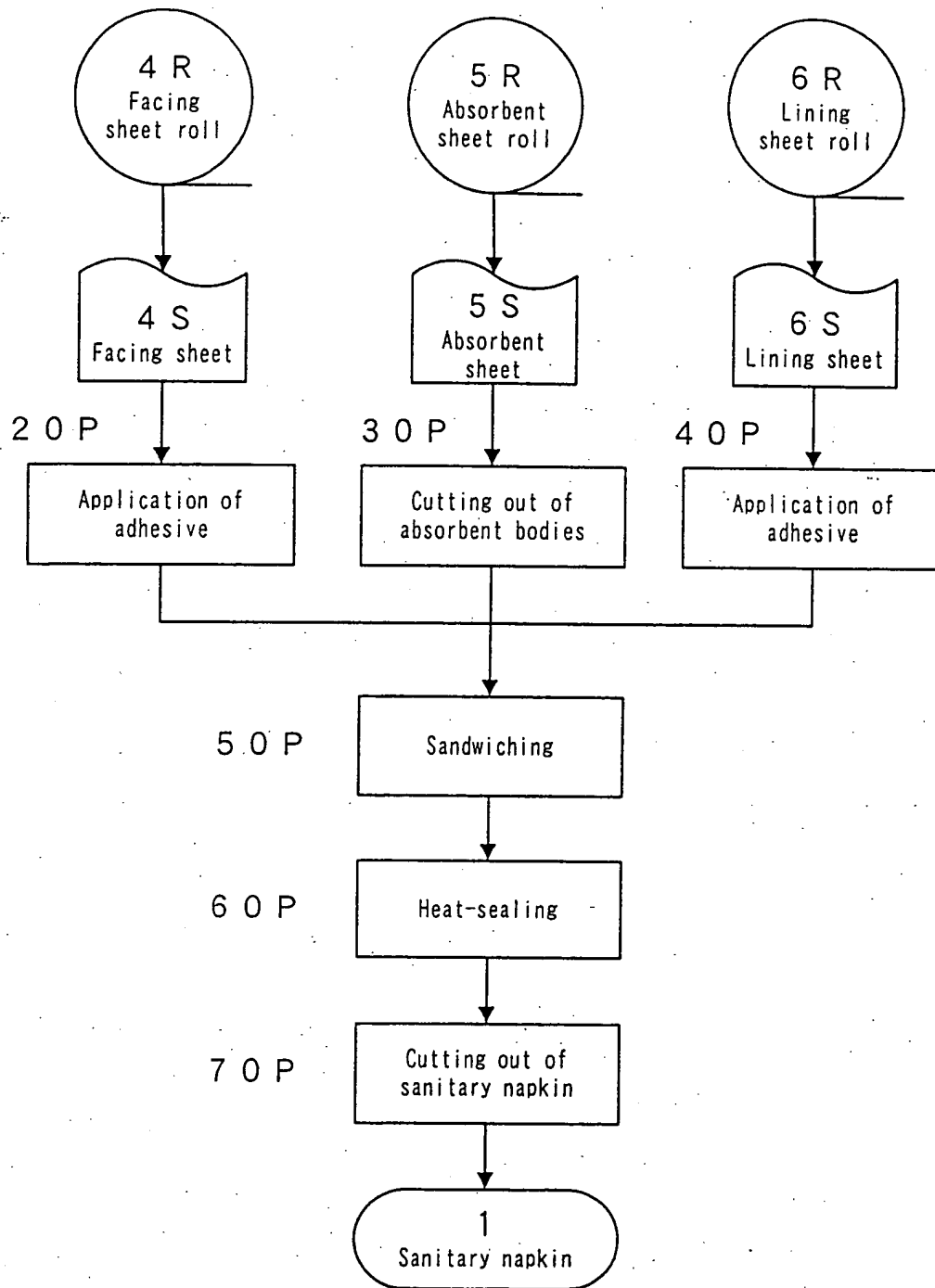


FIG. 3

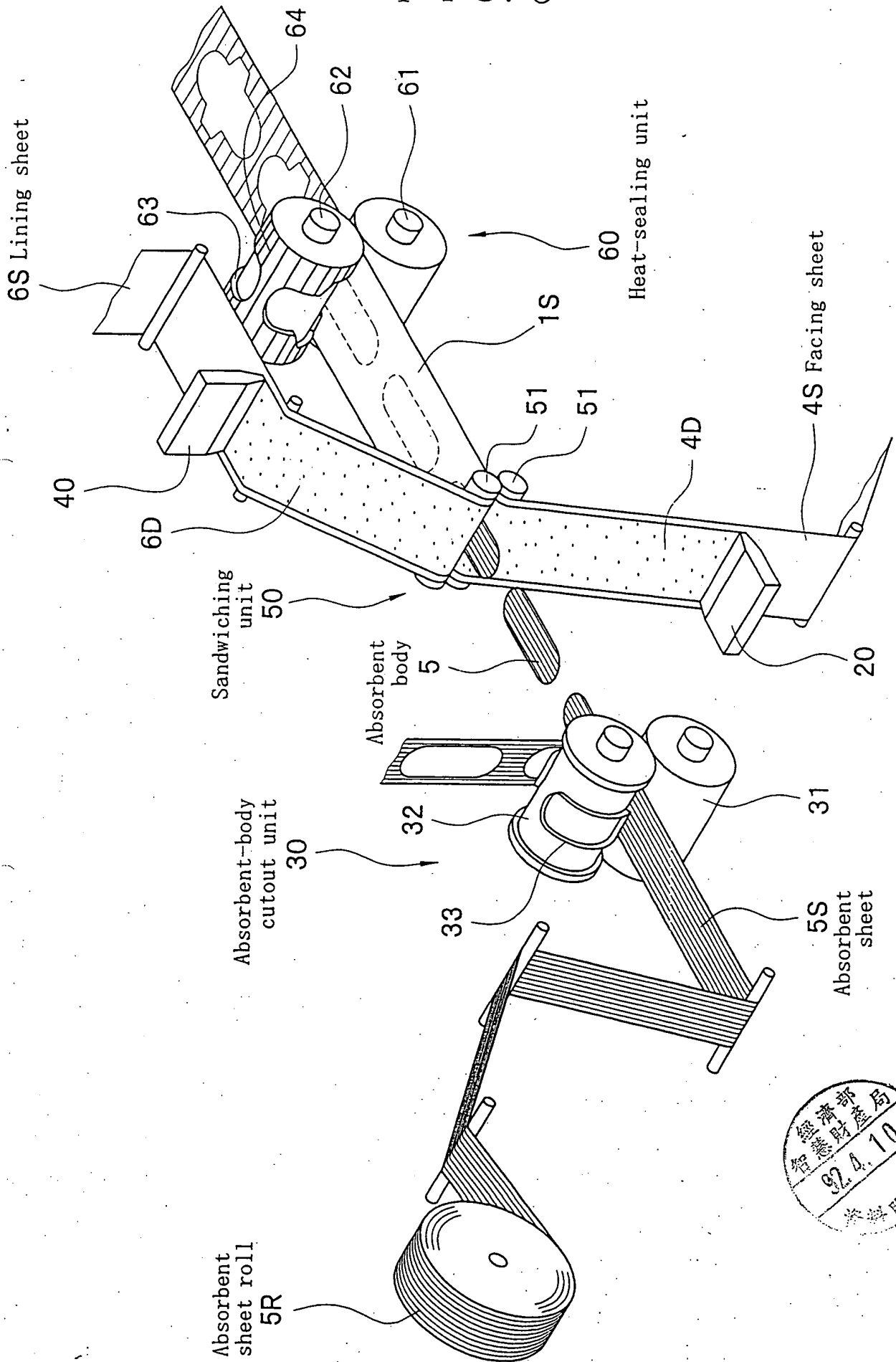


FIG. 4

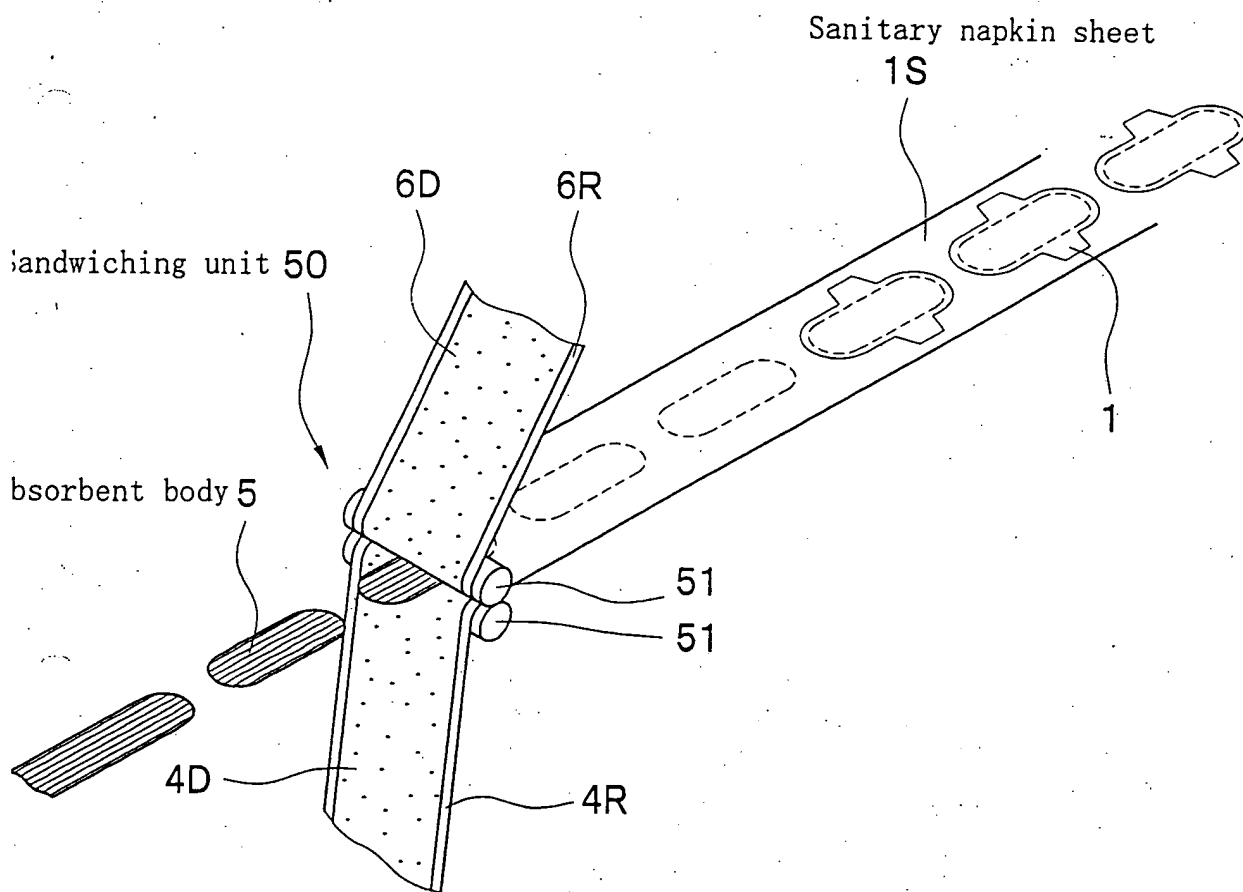


FIG. 5

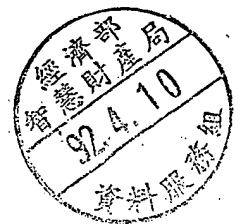
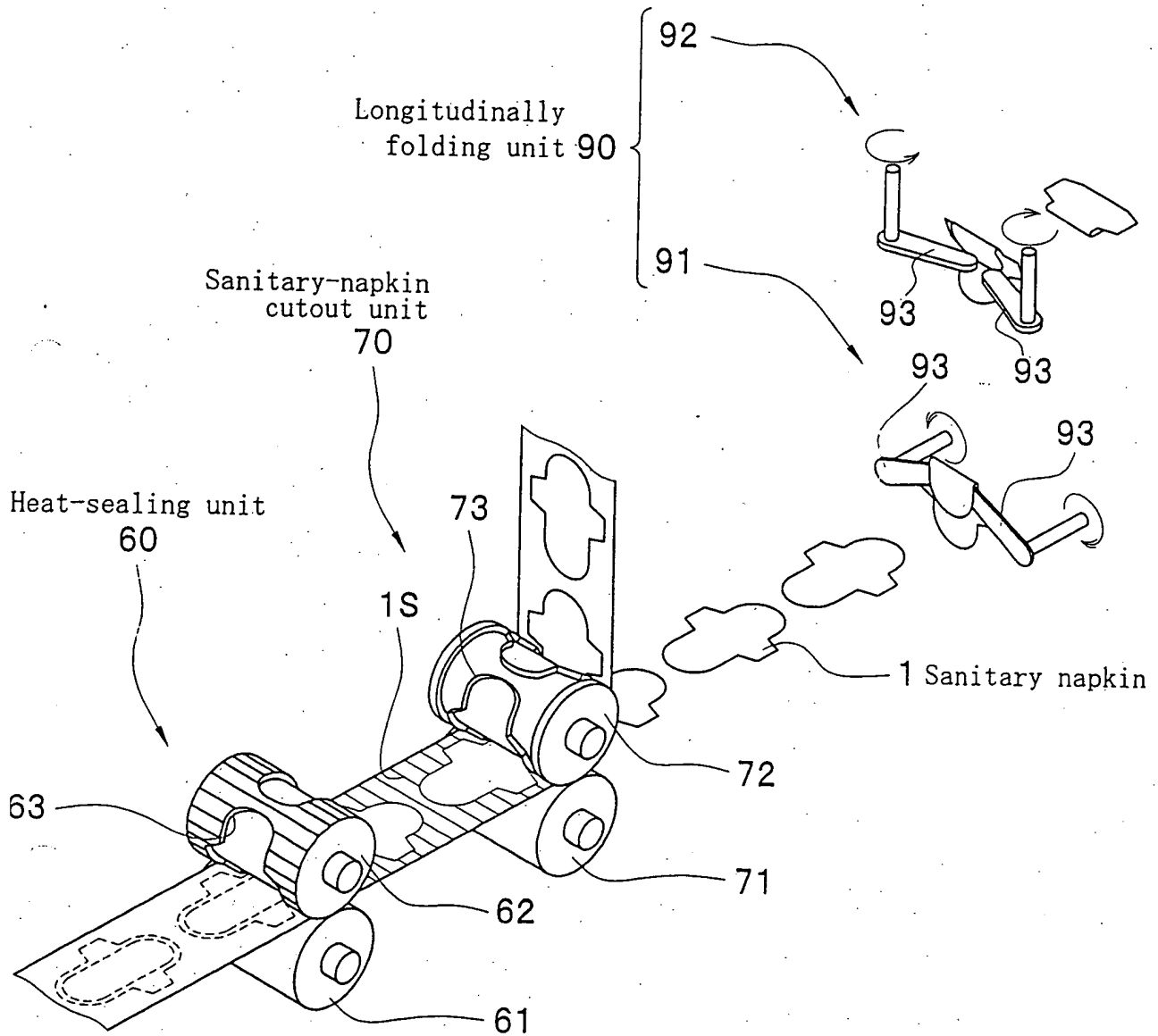


FIG. 6

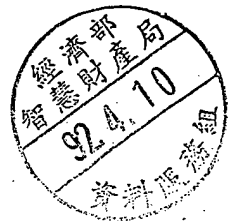
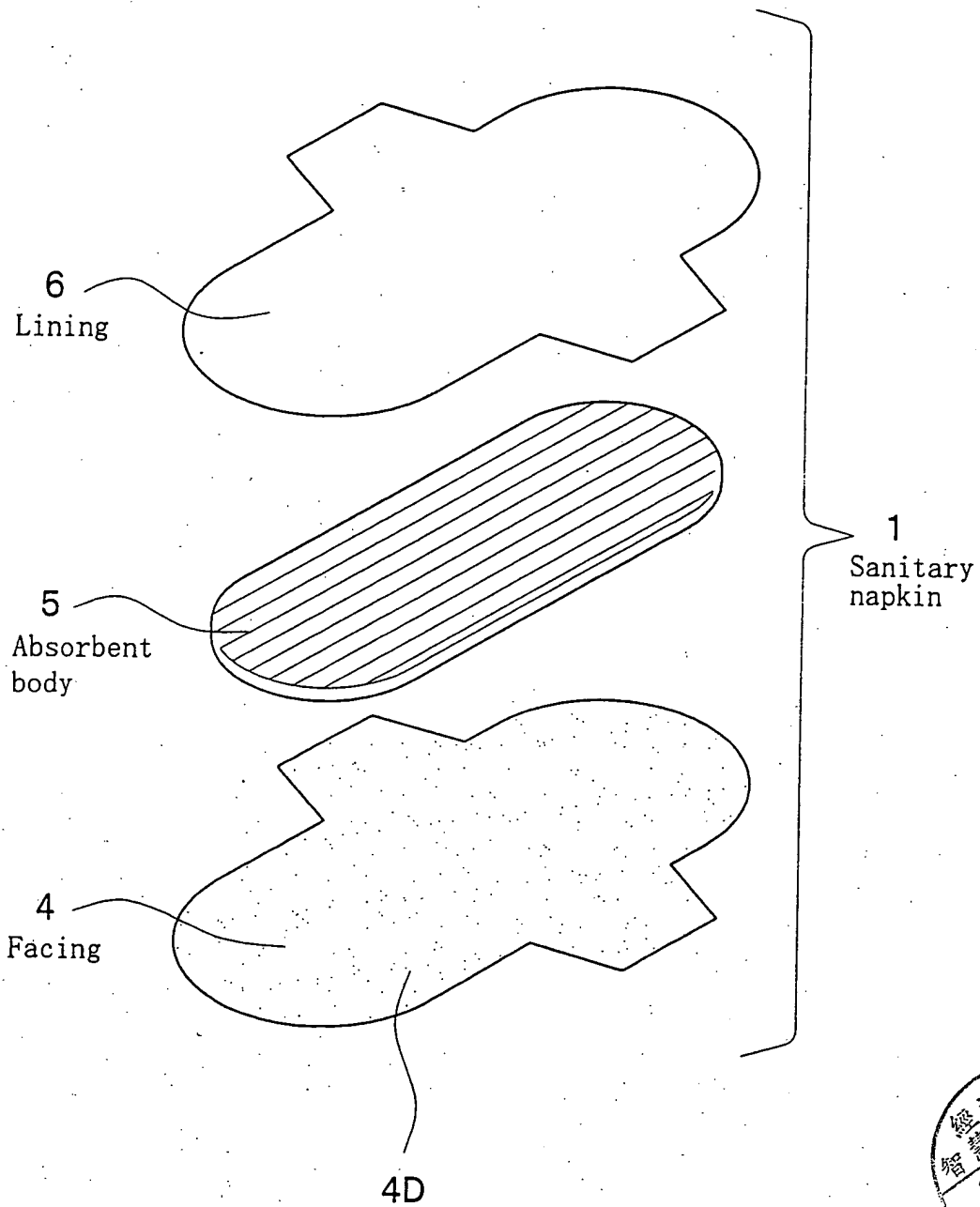


FIG. 7

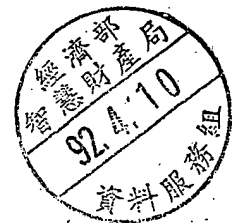
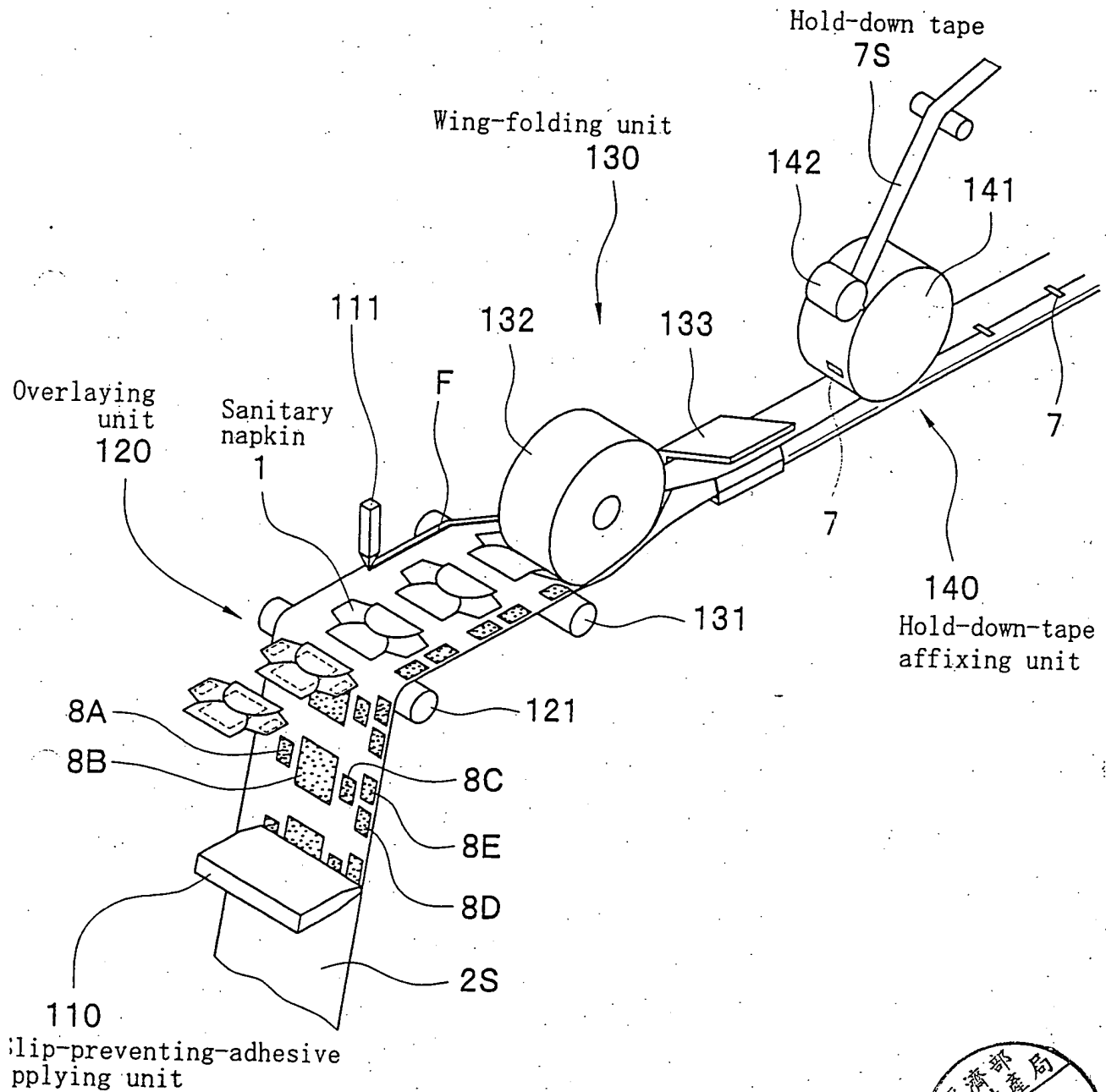


FIG. 8

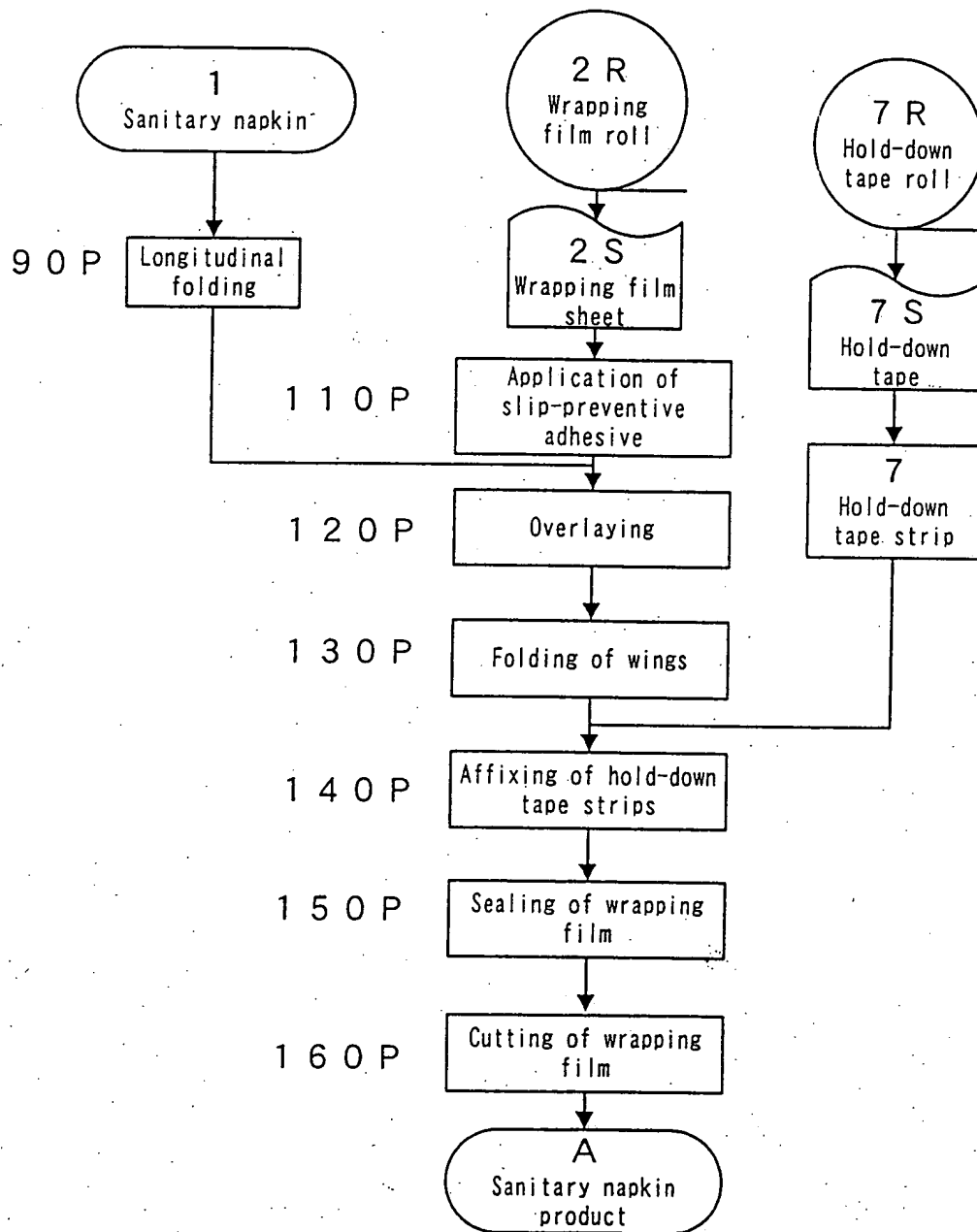
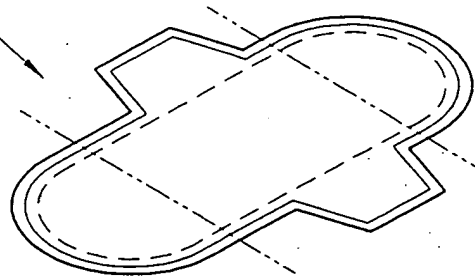


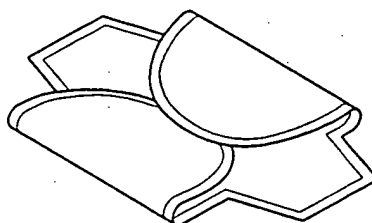
FIG. 9

Sanitary napkin 1



(A)

1



Wrapping film sheet

2S

8A

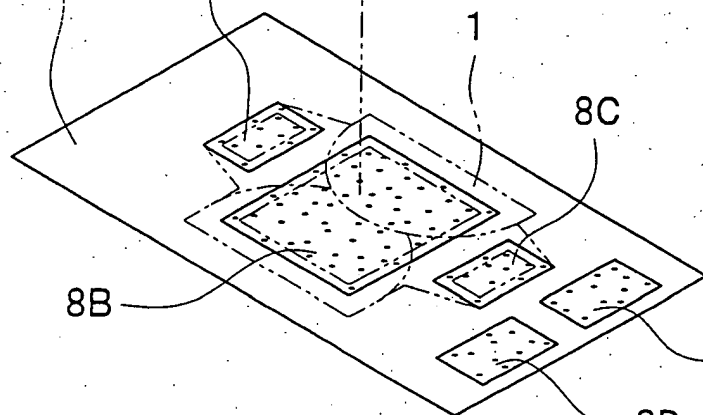
1

8C

8B

8E

8D



(B)



FIG. 10

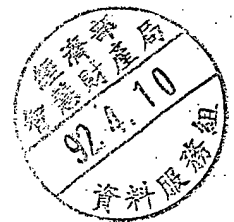
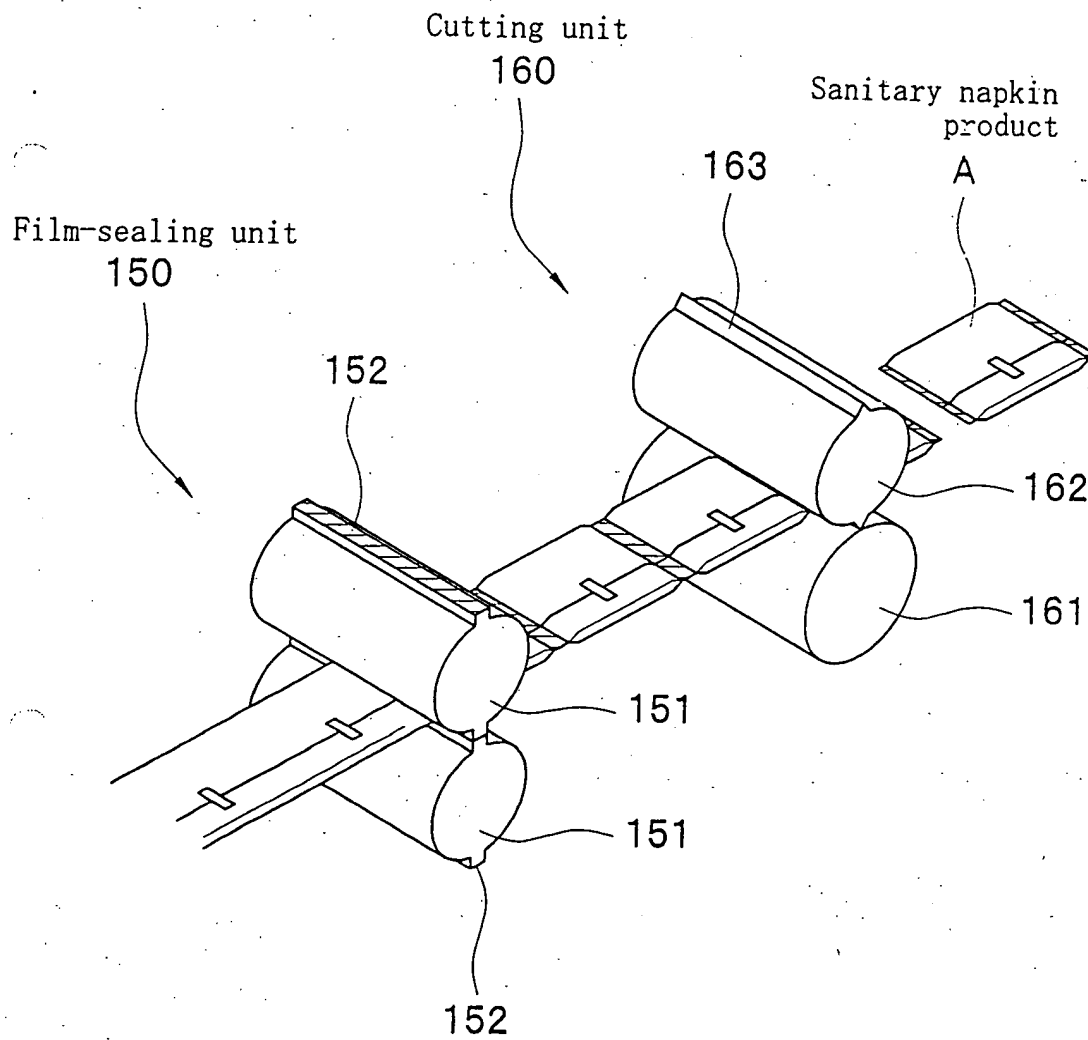
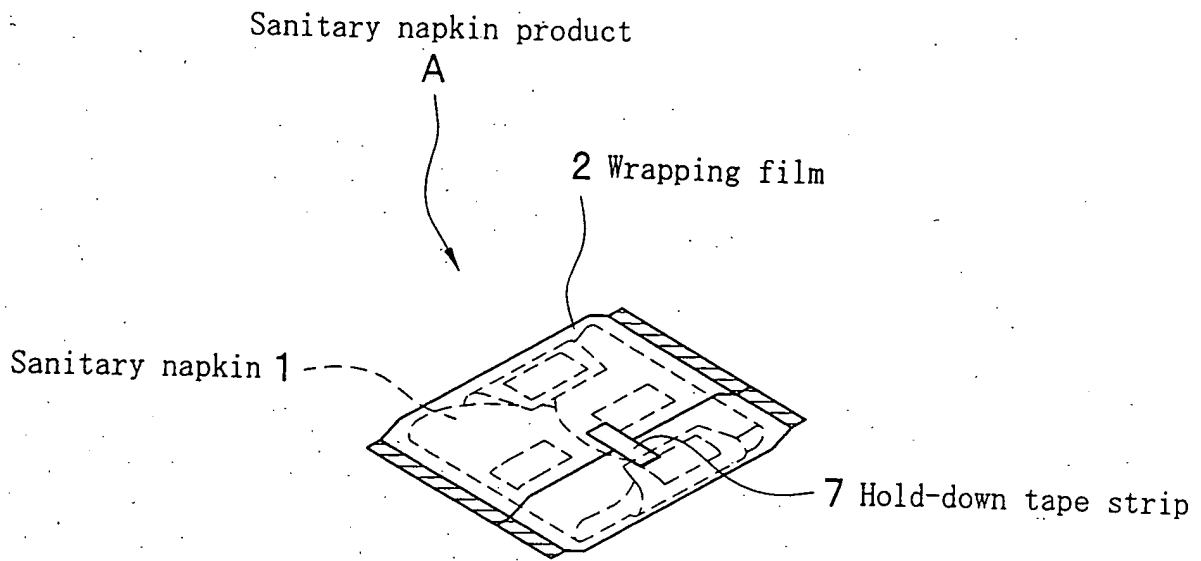
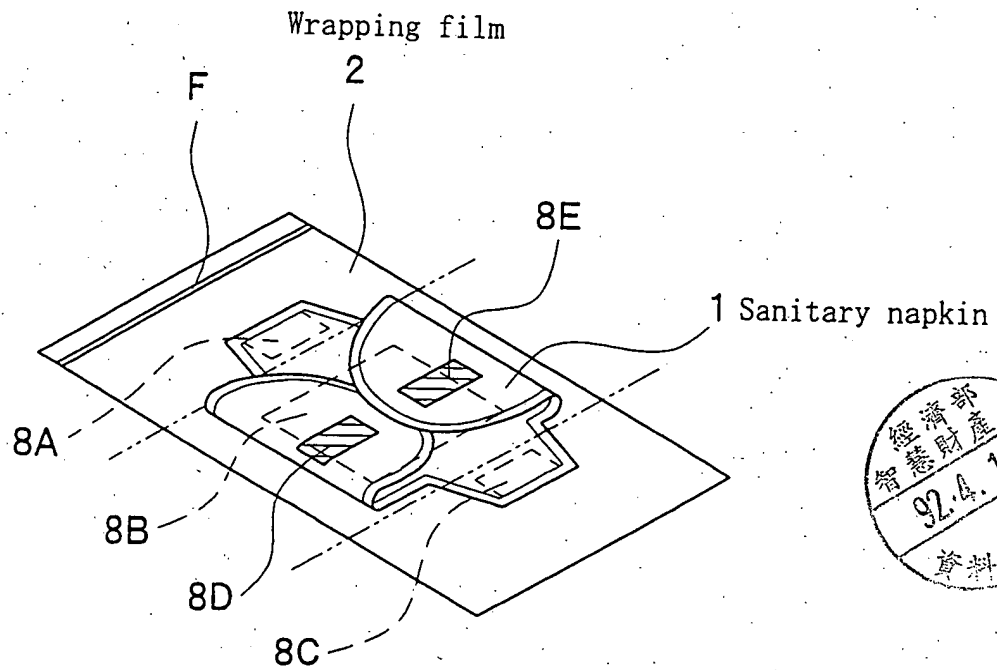


FIG. 11



(I)



(II)



FIG. 12

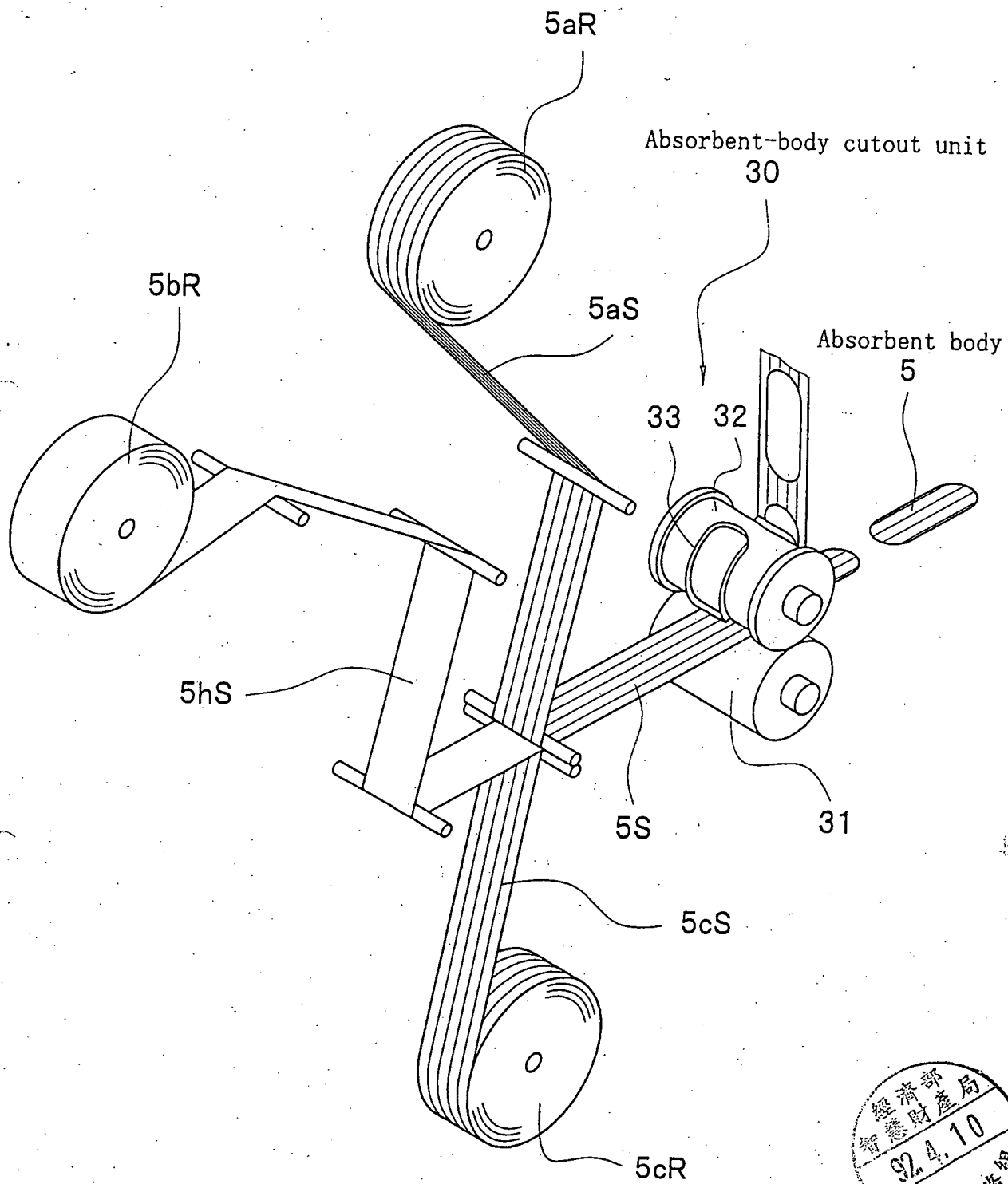
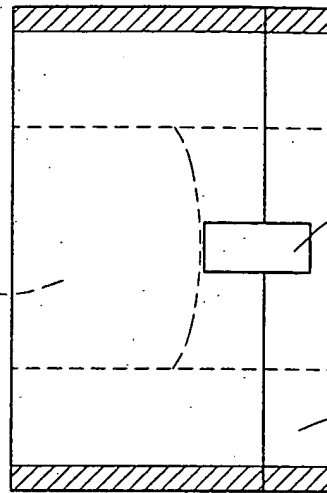


FIG. 13

Sanitary napkin product
201

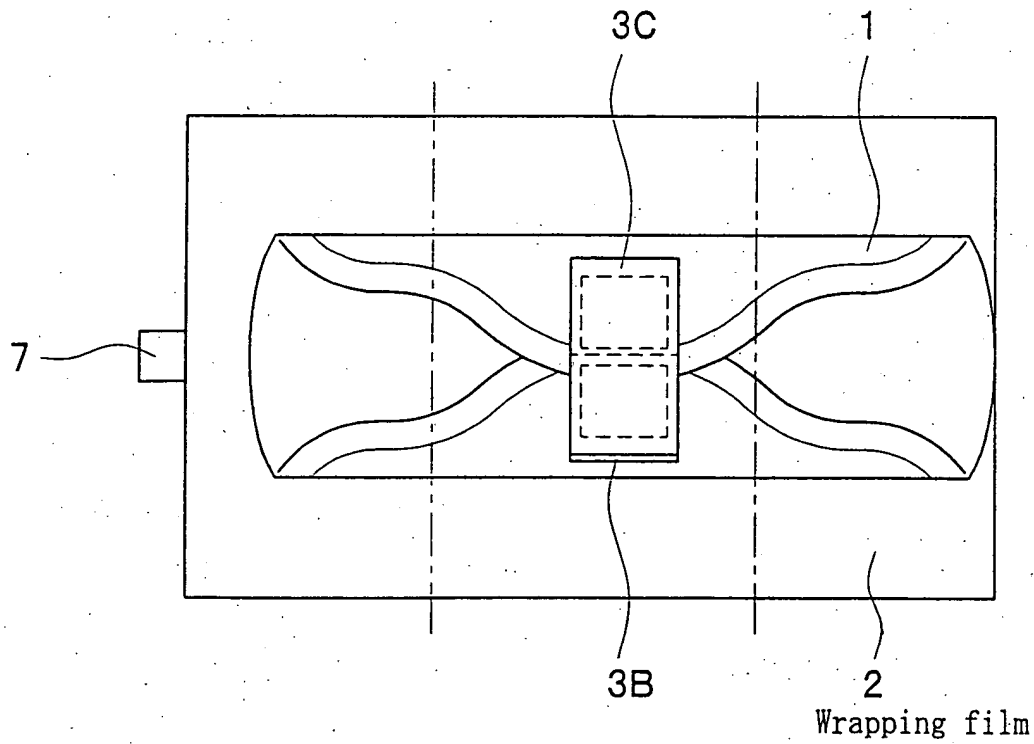
Sanitary napkin 1



7

2 Wrapping film

(I)



3C

1

7

3B

2 Wrapping film

(II)



FIG. 14

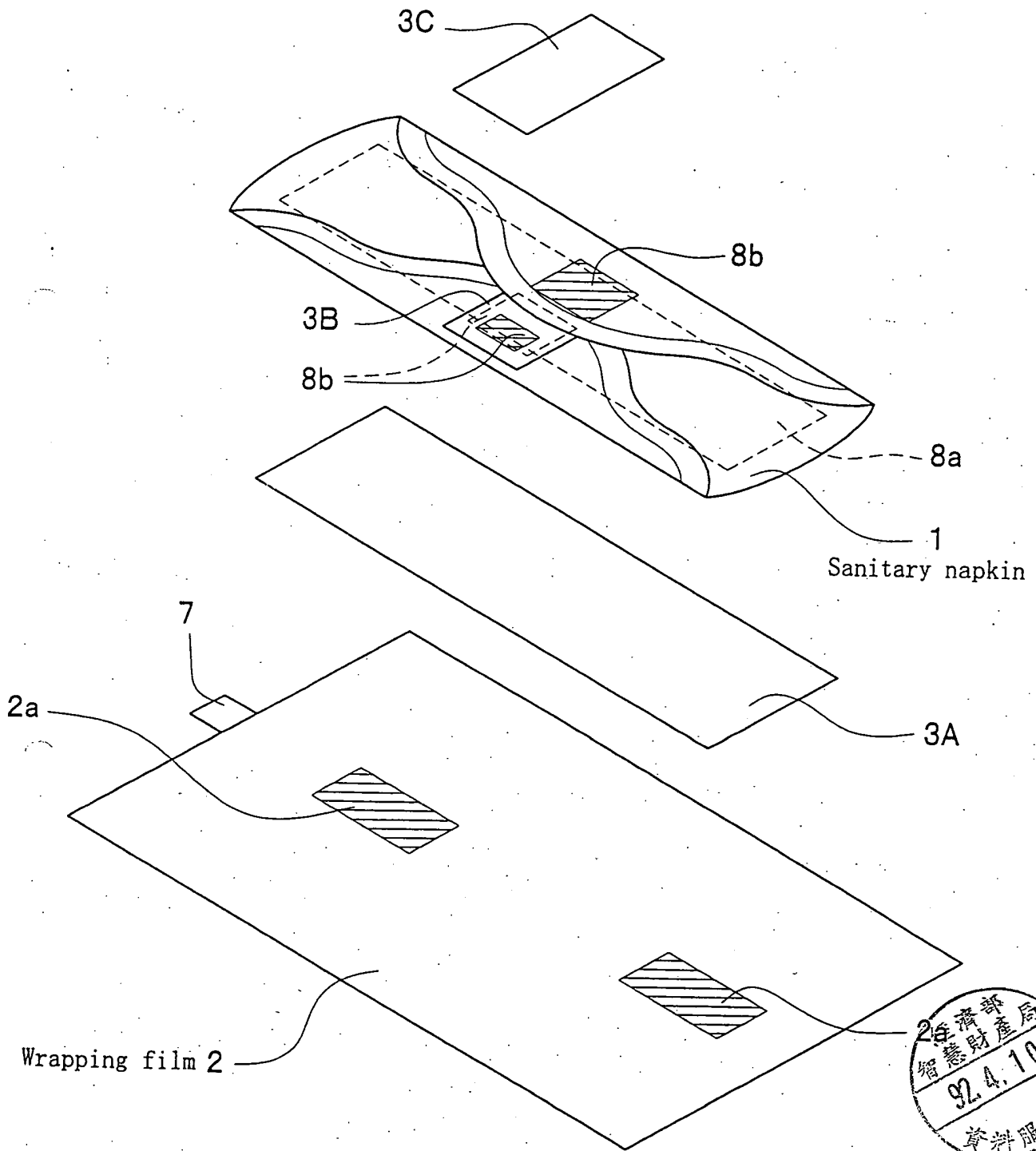


FIG. 15

